Vol. 890 Number 5

OFFICIAL GAZETTE

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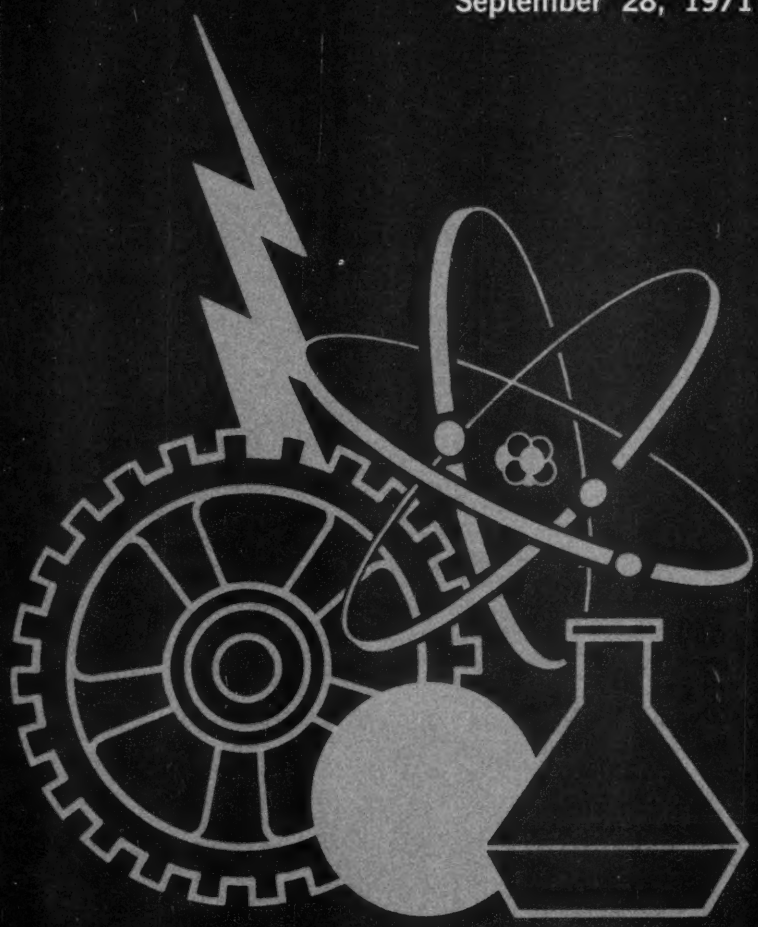
PATENTS

September 28, 1971



U. S. DEPARTMENT OF COMMERCE
Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

September 28, 1971 Volume 890 Number 5

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PATENT OFFICE NOTICES

PRESIDENTIAL DOCUMENTS, TITLE 3—THE PRESIDENT

MEMORANDUM OF AUGUST 23, 1971

Government Patent Policy

Memorandum for Heads of Executive Departments and Agencies

THE WHITE HOUSE,
Washington, August 23, 1971.

On October 10, 1963, President Kennedy forwarded to the Heads of Executive Departments and Agencies a Memorandum and Statement of Government Patent Policy for their guidance in determining the disposition of rights to inventions made under Government-sponsored grants and contracts. On the basis of the knowledge and experience then available, this Statement first established Government-wide objectives and criteria, within existing legislative constraints, for the allocation of rights to inventions between the Government and its contractors.

It was recognized that actual experience under the Policy could indicate the need for revision or modification, Accordingly, a Patent Advisory Panel was established under the Federal Council for Science and Technology for the purpose of assisting the agencies in implementing the Policy, acquiring data on the agencies' operations under the Policy, and making recommendations regarding the utilization of Government-owned patents. In December 1965, the Federal Council established the Committee on Government Patent Policy to assess how this Policy was working in practice, and to acquire and analyze additional information that could contribute to the reaffirmation or modification of the Policy.

The efforts of both the Committee and the Panel have provided increased knowledge of the effects of Government patent policy on the public interest. More specifically, the studies and experience over the past 7 years have indicated that:

(a) A single presumption of ownership of patent rights to Government-sponsored inventions either in the Government or in its contractors is not a satisfactory basis for Government patent policy, and that a flexible, Government-wide policy best serves the public interest;

(b) The commerical utilization of Government-sponsored inventions, the participation of industry in Government research and development programs, and commercial competition can be influenced by the following factors: the mission of the contracting agency; the purpose and nature of the contract; the commercial applicability and market potential of the invention; the extent to which the invention is developed by the contracting agency; the promotional activities of the contracting agency; the commercial orientation of the contractor and the extent of his privately financed research in the related technology; and the size, nature and research orientation of the pertinent industry;

(c) In general, the above factors are reflected in the basic principles of the 1963 Presidential Policy Statement.

Based on the results of the studies and experience gained under the 1963 Policy Statement certain improvements in the Policy have been recommended which would provide (1) agency heads with additional authority to permit contractors to obtain greater rights to inventions where necessary to achieve utilization or where equitable circumstances would justify such allocation of rights, (2) additional guidance to the agencies in promoting the utilization of Government-sponsored inventions, (3) clarification of the rights of States and municipal governments in inventions in which the Federal Government acquires a license, and (4) a more definitive data base for evaluating the administration and effectiveness of the Policy and the feasibility and desirability of further refinement or modification of the Policy.

I have approved the above recommendations and have attached a revised Statement of Government Patent Policy for your guidance. As with the 1963 Policy Statement, the Federal Council shall make a continuing effort to record, monitor and evaluate the effects of this Policy Statement. A Committee on Government Patent Policy, operating under the aegis of the Federal Council for Science and Technology, shall assist the Federal Council in these matters.

This memorandum and statement of policy shall be published in the Federal Register.

RICHARD NIXON.

STATEMENT OF GOVERNMENT PATENT POLICY

BASIC CONSIDERATIONS

A. The Government expends large sums for the conduct of research and development which results in a considerable number of inventions and discoveries.

B. The inventions in scientific and technological fields resulting from work performed under Government contracts constitute a valuable national resource.

C. The use and practice of these inventions and discoveries should stimulate inventors, meet the needs of the Government, recognize the equities of the contractor, and serve the public interest.

D. The public interest in a dynamic and efficient economy requires that efforts be made to encourage the expeditious development and civilian use of these inventions. Both the need for incentives to draw forth private initiatives to this end, and the need to promote healthy competition in industry must be weighed in the disposition of patent rights under Government contracts. Where exclusive rights are acquired by the contractor, he remains subject to the provisions of the antitrust laws.

E. The public interest is also served by sharing of benefits of Government-financed research and development with foreign countries to a degree consistent with our international programs and with the objectives of U.S. foreign policy.

F. There is growing importance attaching to the acquisition of foreign patent rights in furtherance of the interests of U.S. industry and the Government.

G. The prudent administration of Government research and development calls for a Government-wide policy on the disposition of inventions made under Government contracts reflecting common principles and objectives, to the extent consistent with the missions of the respective agencies. The policy must recognize the need for flexibility to accommodate special situations.

POLICY

SECTION 1. The following basic policy is established for all Government agencies with respect to inventions or discoveries made in the course of or under any contract of any Government agency, subject to specific statutes governing the disposition of patent rights of certain Government agencies.

(a) Where

(1) a principal purpose of the contract is to create, develop or improve products, processes, or methods which are intended for commercial use (or which are otherwise intended to be made available for use) by the general public at home or abroad, or which will be required for such use by governmental regulations; or

(2) a principal purpose of the contract is for exploration into fields which directly concern the public health, public safety, or public welfare; or

(3) the contract is in a field of science or technology in which there has been little significant experience outside of work funded by the Government, or where the Government has been the principal developer of the field, and the acquisition of exclusive rights at the time of contracting might confer on the contractor a preferred or dominant position; or

(4) the services of the contractor are

(i) for the operation of a Government-owned research or production facility; or

(ii) for coordinating and directing the work of others,

the Government shall normally acquire or reserve the right to acquire the principal or exclusive rights throughout the world in and to any inventions made in the course of or under the contract.

In exceptional circumstances the contractor may acquire greater rights than a nonexclusive license at the time of contracting where the head of the department or agency certifies that such action will best serve the public interest. Greater

rights may also be acquired by the contractor after the invention has been identified where the head of the department or agency determines that the acquisition of such greater rights is consistent with the intent of this Section 1(a) and is either a necessary incentive to call forth private risk capital and expense to bring the invention to the point of practical application or that the Government's contribution to the invention is small compared to that of the contractor. Where an identified invention made in the course of or under the contract is not a primary object of the contract, greater rights may also be acquired by the contractor under the criteria of Section 1(c).

(b) In other situations, where the purpose of the contract is to build upon existing knowledge or technology, to develop information, products, processes, or methods for use by the Government, and the work called for by the contract is in a field of Technology in which the contractor has acquired technical competence (demonstrated by factors such as know-how, experience, and patent position) directly related to an area in which the contractor has an established nongovernmental commercial position, the contractor shall normally acquire the principal or exclusive rights throughout the world in and to any resulting inventions.

(c) Where the commercial interests of the contractor are not sufficiently established to be covered by the criteria specified in Section 1(b) above, the determination of rights shall be made by the agency after the invention has been identified, in a manner deemed most likely to serve the public interest as expressed in this policy statement, taking particularly into account the intentions of the contractor to bring the invention to the point of commercial application and the guidelines of Section 1(a) hereof, provided that the agency may prescribe by regulation special situations where the public interest in the availability of the inventions would best be served by permitting the contractor to acquire at the time of contracting greater rights than a nonexclusive license.

(d) In the situations specified in Sections 1(b) and 1(c), when two or more potential contractors are judged to have presented proposals of equivalent merit, willingness to grant the Government principal or exclusive rights in resulting inventions will be an additional factor in the evaluation of the proposals.

(e) Where the principal or exclusive rights in an invention remain in the contractor, he should agree to provide written reports at reasonable intervals, when requested by the Government, on the commercial use that is being made or is intended to be made of inventions made under Governmental contracts.

(f) Where the principal or exclusive rights in an invention remain in the contractor, unless the contractor, his licensee, or his assignee has taken effective steps within three years after a patent issues on the invention to bring the invention to the point of practical application or has made the invention available for licensing royalty-free or on terms that are reasonable in the circumstances, or can show cause why he should retain the principal or exclusive rights for a further period of time, the Government shall have the right to require the granting of a nonexclusive or exclusive license to a responsible applicant(s) on terms that are reasonable under the circumstances.

(g) Where the principal or exclusive rights to an invention are acquired by the contractor, the Government shall have the right to require the granting of a nonexclusive or exclusive license to a responsible applicant(s) on terms that are reasonable in the circumstances (i) to the extent that the invention is required for public use by governmental regulations, or (ii) as may be necessary to fulfill health or safety needs, or (iii) for other public purposes stipulated in the contract.

(h) Whenever the principal or exclusive rights in an invention remain in the contractor, the Government shall normally acquire, in addition to the rights set forth in Sections 1(e), 1(f), and 1(g),

(1) at least a nonexclusive, nontransferable, paid-up license to make, use, and sell the invention throughout the world by or on behalf of the Government of the United States (including any Government agency) and States and domestic municipal governments, unless the agency head determines that it would not be in the public interest to acquire the license for the States and domestic municipal governments; and

(2) the right to sublicense any foreign government pursuant to any existing or future treaty or agreement if the agency head determines it would be in the national interest to acquire this right; and

(3) the principal or exclusive rights to the invention in any country in which the contractor does not elect to secure a patent.

(i) Whenever the principal or exclusive rights in an invention are acquired by the Government, there may be reserved to the contractor a revocable or irrevocable nonexclusive royalty-free license for the practice of the invention throughout the world; an agency may reserve the right to revoke such license so that it might grant an exclusive license when it determines that some degree of exclusivity may be necessary to encourage further development and commercialization of the invention. Where the Government has a right to acquire the principal or exclusive rights to an invention and does not elect to secure a patent in a foreign country, the Government may permit the contractor to acquire such rights in any foreign country in which he elects to secure a patent, subject to the Government's rights set forth in Section 1(h).

SEC. 2. Under regulations prescribed by the Administrator of General Services, Government-owned patents shall be made available and the technological advances covered thereby brought into being in the shortest time possible through dedication or licensing, either exclusive or non-exclusive, and shall be listed in official Government publications or otherwise.

SEC. 3. The Federal Council for Science and Technology in consultation with the Department of Justice shall prepare at least annually a report concerning the effectiveness of this policy, including recommendations for revision or modification as necessary in light of the practices and determinations of the agencies in the disposition of patent rights under their contracts. The Federal Council for Science and Technology shall continue to

(a) develop by mutual consultation and coordination with the agencies common guidelines for the implementation of this policy, consistent with existing statutes, and to provide overall guidance as to disposition of inventions and patents in which the Government has any right or interest; and

(b) acquire data from the Government agencies on the disposition of patent rights to inventions resulting from federally financed research and development and on the use and practice of such inventions to serve as bases for policy review and development; and

(c) make recommendations for advancing the use and exploitation of Government-owned domestic and foreign patents.

Each agency shall record the basis for its actions with respect to inventions and appropriate contracts under this statement.

SEC. 4. Definitions: As used in this policy statement, the stated terms in singular and plural are defined as follows for the purposes hereof:

(a) *Government agency*—includes any executive department, independent commission, board, office, agency, administration, authority, Government corporation, or other Government establishment of the executive branch of the Government of the United States of America.

(b) *States*—means the States of the United States, the District of Columbia, Puerto Rico, the Virgin Islands, American Samoa, Guam and the Trust Territory of the Pacific Islands.

(c) *Invention, or Invention or discovery*—includes any art, machine, manufacture, design, or composition of matter, or any new and useful improvement thereof, or any variety of plant, which is or may be patentable under the Patent Laws of the United States of America or any foreign country.

(d) *Contractor*—means any individual, partnership, public or private corporation, association, institution, or other entity which is a party to the contract.

(e) *Contract*—means any actual or proposed contract, agreement, grant, or other arrangement, or subcontract entered into with or for the benefit of the Government where a purpose of the contract is the conduct of experimental, developmental, or research work.

(f) *Made*—when used in relation to any invention or discovery means the conception or first actual reduction to practice of such invention in the course of or under the contract.

(g) *To the point of practical application*—means to manufacture in the case of a composition or product, to practice in the case of a process, or to operate in the case of a machine and under such conditions as to establish that the invention

is being worked and that its benefits are reasonably accessible to the public.

[FR Doc. 71-12623; Filed 8-25-71; 10:41 am]

36 F.R. 16887-16892; Aug. 26, 1971

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

3,050,087, D. M. Caplan, FLEXIBLE HOSE; **3,194,705,** same, METHOD AND APPARATUS FOR MAKING REINFORCED CORRUGATED HOSE, **filed** May 24, 1971, D.C. Colo. (Denver), Doc. C-3138, *H. K. Porter Company, Inc.* v. *The Gates Rubber Company.* **Same, filed** May 26, 1971, D.C., S.D. Ohio (Dayton), Doc. C-4059, *H. K. Porter Co., Inc.* v. *Dayco Corporation.* **Same, filed** May 27, 1971, D.C., W.D. Pa. (Pittsburgh), Doc. C.A. 71-501, *Dayco Corporation* v. *H. K. Porter Company, Inc.* **Same, filed** May 27, 1971, D.C., W.D. Pa. (Pittsburgh), Doc. C.A. 71-495, *The Gates Rubber Company* v. *H. K. Porter Company, Inc.*

3,061,812, A. Z. Rachwalski, PULSE TYPE DEPTH SOUNDER; **D. 189,914,** Emerson and Curtis, INDICATING DEVICE, **filed** Sept. 22, 1967, D.C. Del. (Wilmington), Doc. 3406, *Jetronic Industries Inc.* v. *Raytheon Company.* Stipulation for dismissal under Rule 41 without prejudice, Apr. 2, 1971.

3,103,666, A. R. Bone, TAG ATTACHING APPARATUS, **filed** May 25, 1971, D.C., S.D.N.Y., Doc. 71-C-2333, *Dennison Manufacturing Company* v. *Ben Clements & Sons, Inc.*

3,104,699, Wolf, Holland and Sharp, OVERHEAD DOOR CONSTRUCTION; **3,169,612,** same; **D. 194,094,** Wolf and Holland, OVERHEAD GARAGE DOOR, **filed** Mar. 1, 1967, D.C.N.J. (Trenton), Doc. 224-67, *Frantz Manufacturing Company* v. *Ridge Nassau Corporation.* Consent order of dismissal without prejudice, May 4, 1971.

3,129,927, A. D. Mast, MIXING APPARATUS FOR FLUENT MATERIAL, **filed** June 3, 1971, D.C., E.D. Pa. (Philadelphia), Doc. CA-71-1353, *Feedmobile, Inc.* v. *Portable Mills, Inc.*

3,141,105, J. S. Courtney-Pratt, CATHODE RAY TUBE WITH COMPOSITE MULTIPLE CLASS FIBRE FACE, **filed** Apr. 9, 1971, U.S. Ct. of Cl., Doc. 293-71, *American Optical Corporation* v. *The United States.*

3,141,872, Natta, Pino and Mazzanti, POLYMERIZATION CATALYST AND STEREOSPECIFIC POLYMERIZATION OF PROPYLENE THEREWITH, **filed** Oct. 13, 1970, D.C., W.D. Tex. (Pecos), Doc. MO-70-CA-85, *Montecatini Edison S.p.A.* v. *Dart Industries Inc.* This action as to defendant Dart Industries Inc., was transferred to U.S. District Court of Delaware, June 8, 1971. Defendant El Paso Products was severed therefrom and action against it stayed pending final determination of suit against defendant Dart Industries Inc. in the District of Delaware, June 11, 1971.

3,161,997, G. W. Balz, FINISHING AND POLISHING METHOD; **3,161,998,** same, FINISHING APPARATUS AND METHOD, **filed** May 7, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1108, *Roto-Finish Company* v. *Eltramatic Equipment Co.*

3,161,998. (See 3,161,997.)

3,168,763, W. B. Gilbert, SOLID CORE DOOR, **filed** Apr. 30, 1971, D.C., E.D. Mich. (Detroit), Doc. 36423, *Lifetime Doors, Inc.* v. *Walled Lake Door Company.*

3,169,612. (See 3,104,699.)

3,171,507. (See 3,275,724.)

3,194,705. (See 3,050,087.)

3,239,952, Lange and Lange, SKI BOOT; **3,419,974,** same, **filed** Apr. 20, 1971, D.C. Colo. (Denver), Doc. C-3047, *The Lange Co.* v. *Pepi's Sport's, Inc.*

3,251,016, Manetti and Brugger, ELECTRON TUBE SOCKETS; **3,543,098,** Simovits, Jr., Dumas and Manetti, ELECTRON TUBE SOCKET ASSEMBLY, **filed** Apr. 1, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c813, *American Plasticraft Co.* v. *Permonite Mfg. Co.*

3,253,741, Russell and Anderson, CAR WASH DEVICE; **3,389,860,** H. L. Null, AUTOMOTIVE VEHICLE WASH SYSTEMS, **filed** Aug. 28, 1968, D.C.N.J. (Newark), Doc. 879-68, *Bernardi Bros., Inc.* v. *Pride Manufacturing, Inc. et al.* Order of dismissal of action, May 24, 1971.

3,275,724, J. G. Klingel, METHOD OF AUTOCLAVING CONCRETE BLOCKS, **3,171,507,** same, MUFFLER FOR FIRED HEATER AUTOCLAVE SYSTEM; **3,423,805,** same, AUTOCLAVING APPARATUS, **filed** Dec. 5, 1966, D.C., W.D.N.Y. (Buffalo), Doc. C-1966-214, *Struthers Scientific and International Corp.* v. *Rappl & Hoenig Co., Inc.* Judgment restraining defendant from further infringing, May 20, 1971.

3,277,417, E. C. Rechel, INDUCTOR AND METHOD OF MANUFACTURE; **3,373,390,** E. D. Rechel, ELECTRICAL INDUCTANCE AND METHOD, **filed** Mar. 25, 1971, D.C. Mass. (Boston), Doc. C.A. 71-742-C, *Edwin C. Rechel* v. *Robert E. Tuller and Coil Winding Devices, Inc.*

3,358,088, R. A. Gault, ELECTROMECHANICAL TRANSDUCER, **filed** May 5, 1971, D.C., S.D.N.Y., Doc. 71-C-1991, *CTS Corporation* v. *Becker Electronics Mfg. Corp.*

3,373,390. (See 3,277,417.)

3,389,860. (See 3,253,741.)

3,419,974. (See 3,239,252.)

3,423,805. (See 3,275,724.)

3,543,098. (See 3,251,016.)

D. 189,914. (See 3,061,812.)

D. 194,094. (See 3,104,699.)

Certificates of Correction for the Week of Sept. 28, 1971

Re. 27,135	3,556,358	3,577,920
3,499,226	3,556,840	3,578,198
3,506,637	3,556,939	3,578,834
3,507,902	3,558,414	3,579,012
3,509,900	3,558,506	3,579,127
3,524,063	3,559,293	3,579,572
3,526,026	3,559,663	3,580,089
3,531,539	3,559,890	3,580,238
3,535,340	3,560,227	3,580,459
3,542,502	3,561,838	3,580,466
3,543,173	3,563,948	3,580,472
3,544,393	3,568,835	3,580,954
3,544,561	3,570,740	3,581,473
3,544,656	3,571,951	3,581,597
3,548,066	3,572,262	3,582,267
3,549,077	3,572,549	3,582,584
3,549,572	3,572,703	3,582,807
3,550,979	3,573,645	3,583,330
3,551,337	3,575,570	3,583,498
3,552,220	3,576,410	3,583,658
3,552,980	3,577,012	
3,553,182	3,577,548	

Patents Available for Licensing

DEPARTMENT OF AGRICULTURE

Pursuant to 7 CFR 19.3 (35 FR 7493), the Administrator of the Agricultural Research Service, U.S. Department of Agriculture has determined that certain Department inventions shall be made available for exclusive licensing under the provisions of Government Patent Policy (28 FR 10943) and 7 CFR 19.5 (35 FR 7493). Notice is hereby given that the following Department inventions are available for exclusive licensing:

3,522,238. ACIDIFIED ETHYLENIMINE MODIFIED CEREAL FLOURS, John C. Rankin and Charles R. Russell.

3,373,175. CONJUGATION OF VEGETABLE OILS VIA IRON TRICARBONYL COMPLEX, Edwin N. Frankel.

3,392,177. CONJUGATION OF VEGETABLE OILS VIA IRON TRICARBONYL COMPLEX AND DECOMPOSITION THEREOF BY CARBON MONOXIDE, Edwin N. Frankel.

3,175,928. ANHYDROUS HCl MODIFICATION OF FLOUR, Earl B. Lancaster and Edward L. Griffin, Jr.

3,073,724. PROCESS FOR PREPARING IMPROVED SIZING AGENTS FROM CEREAL FLOURS, John C. Rankin, Charles R. Russell, and John H. Samalik, Sr.

3,515,678. SELECTIVE HYDROGENATION OF SOYBEAN OIL WITH SUPPORTED COPPER CATALYSTS, Sambasivarao Koritala.

3,153,597. POLYMERIC DIALDEHYDE-PROTEIN ADHESIVES AND WOOD LAMINATES THEREWITH, Francis B. Weakley and Charles L. Mehltretter.

3,329,518. PROTEIN GLUE FOR SOUTHERN PINE PLYWOOD, Francis B. Weakley and Charles L. Mehltretter.

3,192,239. PROCESS FOR ADDITION OF ARYLTHIOLS, PHENOLS, AND PHENYL ETHERS TO UNSATURATED FATTY ACIDS, Waldo C. Ault and Abner Eisner.

3,293,237. PROCESS OF SOLUBILIZING NATIVE COLLAGEN BY REACTING SAID COLLAGEN WITH A STOICHIOMETRIC AMOUNT OF MINERAL ACID, Charles J. W. Wiegand.

3,393,214. BENZHYDRYL ESTERS OF DIMER ACID, Winfred E. Parker, Hogan B. Knight, Ronald E. Koos, and Waldo C. Ault.

3,498,737. PROCESS FOR PRODUCING SCULPTURED LACE FROM FLAT LACE, Helen M. Robinson, Albert S. Cooper, Jr., Wilson A. Reeves, and Milton J. Hoffman.

2,979,374. FIBROUS TEXTILE CELLULOSIC PHOSPHONOMETHYL ETHERS, George L. Drake, Jr., Wilson A. Reeves, and John D. Guthrie.

3,503,998. REACTION PRODUCTS OF DIAMINES AND MONOACID CHLORIDE OF MALEOPIMARIC ACID, Walter H. Schuller and Ray V. Lawrence.

3,489,074. HELICAL PUMPING SYSTEM, D. F. Farkas, and M. E. Lazar.

3,391,986. PROCESS FOR SHRINKPROOFING ANIMAL FIBERS, W. J. Thorsen.

3,522,211. POLYIMIDE-POLYAMIDES FROM MALEOPIMARIC ACID DERIVATIVES, Walter H. Schuller and Ray V. Lawrence.

AVAILABILITY OF INVENTIONS PREVIOUSLY ADVERTISED

The following inventions, advertised 36 F.R. 1919, Feb. 3, 1971, remain available for exclusive licensing: 3,165,508; 3,377,302; 3,414,530; 3,425,971; 3,160,552; 3,385,719; 3,205,130; 3,084,094; and 3,431,116.

Applicants for exclusive licenses will have a period of 60 days from date of publication (36 FR 17515, Sept. 1, 1971) in which to file information as required by Sec. 19.6 Application for Licenses, 7 CFR (35 F.R. 7493). Also, applicants should examine all other Sections published under Part 19, Licensing Department Inventions. Applications should be mailed to the Administrator, Agricultural Research Service, U.S. Department of Agriculture, Washington, D.C., 20250.

T. W. EDMINSTER,
Administrator, Agricultural Research Service.

Aug. 27, 1971.

Disclaimers

3,296,848.—*Alfred M. Murphy* and *Carl M. Filak*, Chester, and *Thomas P. Long*, Henrico County, Va. METHOD AND APPARATUS FOR EXTRUDING TUBULAR MEMBERS FROM SOLID BILLETS OR THE LIKE. Patent dated Jan. 10, 1967. Disclaimer filed July 2, 1971, by the assignee, *Reynolds Metals Company.*

Hereby enters this disclaimer to claim 1 of said patent.

3,373,257.—*Lynn H. Matthias*, Fox Point Village, and *Roy E. Wilson*, Milwaukee, Wis. FLUID DAMPED ELECTRIC SWITCH ACTUATOR. Patent dated Mar. 12, 1968. Disclaimer filed Jan. 29, 1971, by the assignee, *Allen-Bradley Company.*

Hereby enters this disclaimer to claims 1, 2, 3, 4 and 5 of said patent.

3,494,352.—*Ronald D. Russo*, East Rutherford, and *James C. Halligan*, Rodburn, N.J. APPARATUS FOR TAKING MULTIPLE SAMPLES. Patent dated Feb. 10, 1970. Disclaimer filed Aug. 20, 1971, by the assignee, *Becton, Dickinson and Company.*

Hereby disclaims the portion of the term of the patent subsequent to Sept. 30, 1986.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF SEPTEMBER 7, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-05-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	3-09-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-20-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	8-03-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-01-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	12-29-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-31-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	7-14-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-21-70
PHYSICS, GROUP 280—R. L. EVANS, Director Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	5-14-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director Industrial Arts; Household, Personal and Fine Arts.	8-17-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	7-06-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	5-15-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-04-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	9-14-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	7-27-70

Expiration of patents: The patents within the range of numbers indicated below expire during September 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

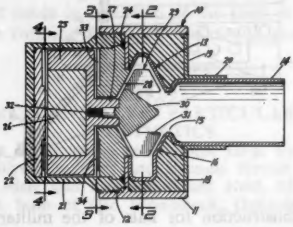
Patents ..... Numbers 2,688,133 to 2,690,559, inclusive
Plant Patents ..... Numbers 1,300 to 1,307, inclusive

PATENTS

GRANTED SEPTEMBER 28, 1971

GENERAL AND MECHANICAL

3,608,088
IMPLANTABLE BLOOD PUMP
Frank D. Dorman, St. Paul, Eugene F. Bernstein, Minneapolis, and Perry L. Blackshear, Mahtomedi, Minn., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.
Filed Apr. 17, 1969, Ser. No. 816,952
Int. Cl. A61f *1/24;* **F04b** *17/00, 35/04*
U.S. Cl. 3—1 **5 Claims**



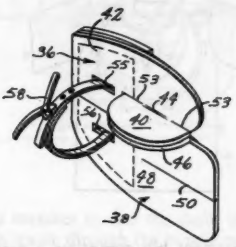
A centrifugal blood pump and method of pumping blood to provide assistance to a failing heart. The pump is intended to be implanted and is provided with a magnetic drive system which permits a synchronous magnetic coupling with an outside power unit with no wires or tubes through the skin. The pump has but a single moving part. It is lubricated by the pumped blood and provides an indefinite lifetime of service-free performance.

3,608,089
BASEBALL CATCHER'S MASK
Peter A. Abbatelli, 833 Nectarine, Sunnyvale, Calif. 94087
Filed Nov. 13, 1969, Ser. No. 876,437
Int. Cl. A42b *1/08*
U.S. Cl. 2—9 **5 Claims**

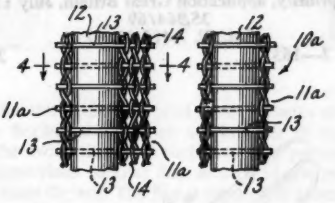
A baseball catcher's protective mask and helmet. The helmet which is to fit over the wearer's head is provided with resilient clips attached to the outside thereof for gripping side portions of the mask in detachable manner so that the mask may be removed from the helmet by gripping the bottom of the mask and pulling it forward.

3,608,090
ARCHER'S TAB
Jack K. Wilson, Norman E. Wilson, and Robert S. Wilson, all of Box 33–H, Springfield, Mo. 65804
Filed Jan. 13, 1970, Ser. No. 2,570
Int. Cl. A41d *19/00*
U.S. Cl. 2—21 **8 Claims**

An archer's tab is provided for use with a bow having a bowstring adapted to receive the nock end of an arrow. The tab includes a flexible finger covering adapted to overlie the portions of an archer's fingers which grasp the bowstring. There is a slot in the covering and means are provided for securing the covering to the archer's hand in a predetermined position with the slot in registered alignment with the space between two of the ancher's fingers. A pair of flaps are on opposite sides of the slot and are adapted to protrude between the archer's two fingers. Slits are provided in each flap so that it will not crumple when the archer bends his fingers.



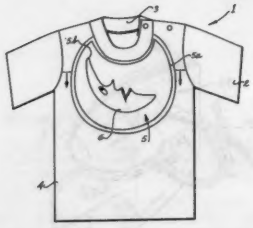
3,608,091
THERMAL FABRICS AND GARMENTS
Mark W. Olson, Allendale, N.J., and Neal A. Truslow, Winnsboro, S.C., assignors to Uniroyal, Inc., New York, N.Y.
Filed Apr. 26, 1968, Ser. No. 724,492
Int. Cl. A62b *17/00*
U.S. Cl. 2—2.1 **10 Claims**



A fabric construction suited for use in making thermal garments to supply heat to or remove heat from the body of the wearer. The fabric includes woven yarn sections separated by parallel, flexible, plastic fluid-conducting tubes extending in the warp direction, the warp yarns being non-stretchable, and the weft or filling yarns preferably being stretchable and passing over and under each length of tubing in an alternating sequence. When embodied in a garment, the fabric is arranged with the warp yarns and the tubes extending along, and with the filling yarns encircling, the respective body portions which they cover, the use of stretchable filling yarns thereby making the garment adaptable to being worn by persons of different girths. Suitable headers are provided in the garment

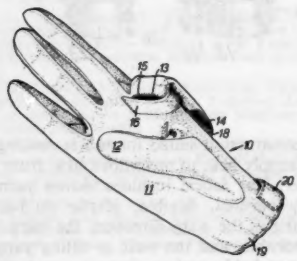
structure to enable a pump carried by the wearer to circulate the thermal (heating or cooling) fluid through the tubing and an associated thermal conditioning device.

3,608,092
INFANT'S GARMENT BIB
Michael A. Taranto, Demerest, N.J., assignor to Glen Designs Incorporated, Englewood, N.J.
Filed Dec. 24, 1969, Ser. No. 887,967
Int. Cl. A41d *13/04*
U.S. Cl. 2—49R 8 Claims



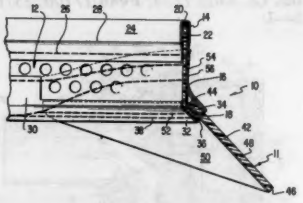
An infant's garment bib comprises a garment portion for clothing at least the torso of an infant and having a neck opening and a front side. A bib portion is located on the front side surrounding in part the neck opening and being integral with the garment portion. The bib portion is composed of at least two layers of material superimposed upon one another with the layer closest to the garment portion constituting a padding material of foam, fibrous sliver or the like. The layers are adhered to one another and to the garment portion along certain lines which define the contour lines of a raised three-dimensional padded resilient appliqué.

3,608,093
SHOOTING GLOVE
Edna M. Kirby, Walsall, England, assignor to Tarantella (Edna Kirby Limited), Walsall, England
Filed Sept. 19, 1969, Ser. No. 859,355
Claims priority, application Great Britain, July 17, 1969, 35,964/69
Int. Cl. A41d *19/00*
U.S. Cl. 2—163 2 Claims



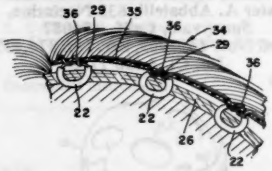
A glove, which is primarily a shooting glove, provided with a finger aperture at the root end of a finger stall on the palm side of the glove and of such size that the wearer can withdraw his finger from the finger stall and extend it through the aperture so that it protrudes to the outside of the glove. Means being provided to retain the empty finger stall in a folded position on the back of the glove. Thus the wearer can obtain trigger sensitivity whilst still wearing a glove having finger stalls.

3,608,094
UNITARY CAP VISOR
Paul G. Gallin, 729 Broadway, New York, N.Y. 10003
Continuation-in-part of abandoned application Ser. No. 682,225, Nov. 13, 1967. This application Jan. 16, 1969, Ser. No. 814,214
Int. Cl. A42b *1/06, 5/00*
U.S. Cl. 2—209.3 4 Claims



A hat construction for hats of the military type, including a visor, the visor being of unitary form and being constructed of plastic material.

3,608,095
METHOD OF FIXING HAIR PIECES TO SCALPS
Robert J. Barry, Cedar Grove, N.J., assignor to Federal Tool Engineering Co., Cedar Grove, N.J.
Filed Mar. 5, 1970, Ser. No. 16,666
Int. Cl. A61f *1/00;* A61b *17/00*
U.S. Cl. 3—1 7 Claims

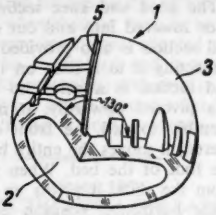


A sterile needle with a small trailing Teflon tube extension is forced through the scalp with end portions of the Teflon tube projecting from the scalp. The Teflon tube extension is adapted to receive a weldable wire which need not be sterilized. The needle is cut off and discarded and the wire is threaded through the Teflon tube now anchored in the scalp and the ends of the wire are welded and trimmed to produce a closed loop or ring to which the hair piece may be anchored by a lacing wire or another ring.

3,608,096
HIP JOINT SOCKET FOR ARTIFICIAL HIPS
Waldemar Link, Hamburg, Germany, assignor to Waldemar Link, Hamburg, Germany
Filed Jan. 23, 1970, Ser. No. 5,177
Int. Cl. A61f *1/24, 5/04*
U.S. Cl. 3—1 5 Claims

A hip joint socket for artificial hips comprises a substantially hemispherical plastic shell in which a likewise substantially hemispherical cavity is provided. The cavity is situated eccentrically in respect to the shell and adapted

to accommodate the spherical upper end of an artificial thigh. The free edge of the hip joint socket, owing to an

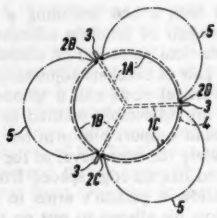


oblique cut made in a portion of the shell, is situated in two planes forming an obtuse angle with each other.

3,608,097
NON-RETURN VALVES PARTICULARLY AS PROSTHETICS

Brian John Bellhouse, The Ridings, Islip, near Oxford, Oxfordshire, England; and Francis Hewitt Bellhouse, 34 Hill Rise; and Kenneth Grant Reid, Marlborough Crescent, both of Old Woodstock, Oxfordshire, England

Filed Jan. 3, 1969, Ser. No. 788,743
Claims priority, application Great Britain, June 28, 1968, 30,888/68
Int. Cl. A61f *1/22;* **F16k** *15/14*
U.S. Cl. 3—1 **9 Claims**



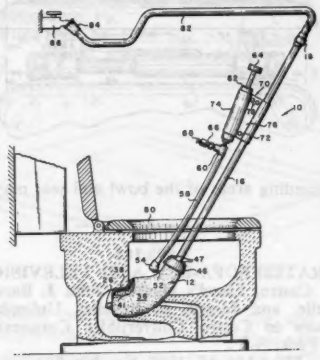
A check-valve which is particularly though not solely applicable as a prosthesis in cardiac surgery: it concerns a valve which has plural cusp-like pliable elements which are associated with a duct formation such as to afford a fluid-dynamic pressure effect tending to close the valve the arrangement of the valve being such as to minimize turbulence when fluid flows through it. The cusps are supported by a rigid frame having three upstanding posts spaced about 120° apart and form a substantially cylindrical opening when the valve is at rest. The cusps are moved to the closed position when reversal of fluid flow occurs through the valve.

3,608,098
DEVICE FOR UNCLOGGING DRAINS OR THE LIKE

Albert Andrisani, 77 S. Park St., Reno, Nev. 89502

Filed May 25, 1970, Ser. No. 40,193
Int. Cl. E03d *11/00*
U.S. Cl. 4—256 **6 Claims**

A device for unclogging drains or the like which includes an elongated, hollow handle portion and an inflatable member connected to a terminal of the handle portion. The inflatable member includes a flexible strip which constitutes a former which may be longitudinally bent to selectively adjust the inflatable member to a rectilinear or curvilinear shape. A water conduit in communication with the hollow handle portion extends longitudinally through the inflatable member, and terminates in a nozzle having an outlet orifice. A source of pneumatic pressure inflates

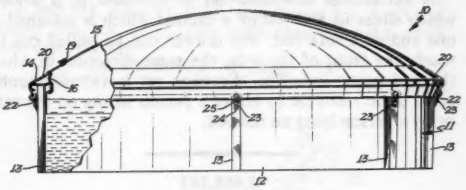


the inflatable member to seal the drain opening. A water source directs water through the handle portion, inflatable member and nozzle to exert hydraulic pressure on obstructions in the drain line.

3,608,099
SWIMMING POOL COVER

Arvel L. Wall, Helena, Ark., assignor to Domain Industries, Inc., New Richmond, Wis.

Filed Oct. 20, 1969, Ser. No. 867,801
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.12 **3 Claims**



An inflatable swimming pool cover includes an air impervious flexible sheet which corresponds in shape and size to the swimming pool surface and is provided with an air impervious annular flap secured to the peripheral edge portions thereof. The flap is adapted to extend below the pool surface and cooperates with the sheet to entrap air between the sheet and the pool surface so that the swimming pool cover is supported by the entrapped air. An annular skirt is secured to the peripheral portions of the sheet and extends outwardly therefrom for attachment to the exterior portions of the swimming pool to retain the inflatable cover in covering relation with respect to the swimming pool.

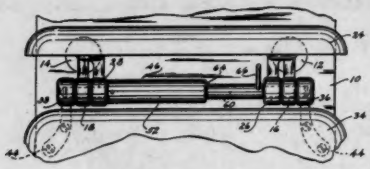
3,608,100
COLLAPSIBLE TOILET-SEAT TRUNNION PIN

Constance M. Trost, 4350 N. 25th St., Milwaukee, Wis. 53209

Filed Mar. 18, 1970, Ser. No. 20,676
Int. Cl. A47k *13/12*
U.S. Cl. 4—236 **4 Claims**

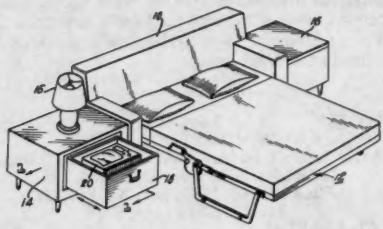
A collapsible trunnion pin to serve as a replacement for the original pin customarily provided with toilet seat

assemblies. This trunnion pin permits convenient dis-assembly of the seat and cover from the bowl fittings so that



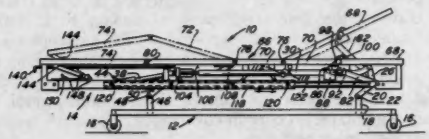
the surrounding areas of the bowl and seat may be easily cleaned.

3,608,101
INTEGRATED SOFA-BED AND TELEVISION UNIT
Bernard Castro, Lloyd's Harbor, John J. Barabas, New Rochelle, and Joseph A. Brindisi, Uniondale, N.Y., assignors to Castro Convertibles Corporation, New Hyde Park, N.Y.
Filed Jan. 16, 1969, Ser. No. 791,700
Int. Cl. A47c *13/38, 17/08*
U.S. Cl. 5—2 **6 Claims**



A retractable television set is mounted in a drawer which slides in and out of a cabinet which is attached to one end of a sofa-bed. The drawer can be pulled out towards the front of the sofa, the same direction in which the bed opens out. The television set is swivel-mounted so as to be viewable by either a person sitting on the sofa, or by a person lying on the bed.

3,608,102
HOSPITAL BED
Robert Goodman, 5325 Westminster Ave., Philadelphia, Pa. 19131
Filed June 27, 1969, Ser. No. 837,274
Int. Cl. A61g *7/10*
U.S. Cl. 5—63 **9 Claims**

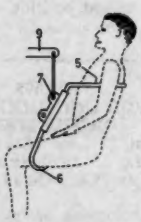


A hospital bed having a supporting base frame and an upper frame which is vertically movable relative to the base frame by means of motor-actuated linkage. The linkage consists of two sets of links, each of which may be separately actuated to raise or lower the corresponding end of the upper frame, or both of which can be simultaneously actuated to raise the entire upper frame at one time. The upper frame supports a bed-spring assembly including a head section, a seat section, a knee section and a foot section, the head and knee sections being pivotally connected to the stationery seat section, and the foot section being pivotally connected to the knee section. The head and knee sections may be separately raised or lowered into and out of inclined positions. The head section is also provided with means for detachably connecting it to a slide on the upper frame. When the head section is attached to the slide, if the head section is pivoted upwardly, it moves the entire bed-spring assembly toward the front of the bed, and when it is lowered, it moves the entire bed-spring assembly toward the foot of the bed. When the head section is detached from the slide, it pivots up and down without affecting the horizontal position of the bed-spring assembly.

3,608,103
DEVICE FOR USE WITH A BED
Wan Sun Seid, 900 N. LaSalle St., Chicago, Ill. 60602
Filed Aug. 2, 1968, Ser. No. 749,781
Int. Cl. E03d *9/04;* **A47c** *21/00*
U.S. Cl. 5—72 **9 Claims**

Device for use with a bed including a head support platform on a first pair of brackets adjustably supported on a first pair of vertical posts and an elbow support platform on a second pair of brackets adjustably supported by the first pair of vertical posts and a second pair of vertical posts which are adjustably secured to one end of a bed frame. The head support platform has an upper surface at approximately the same level as the upper surface of the mattress and has an edge spaced from one end of the mattress to allow a person's arms to extend downwardly and to allow his elbows to rest on the elbow support platform.

3,608,104
CARRYING ASSEMBLY FOR DISABLED OR DISEASED PERSONS, AND LIFTING DEVICE FOR SUCH AN ASSEMBLY
Gerardus Wilhelmus van Geryen, Eindhovenscheweg 56, Valkenswaard, Netherlands
Filed Mar. 4, 1969, Ser. No. 804,211
Claims priority, application Netherlands, Mar. 6, 1968, 6803205
Int. Cl. E03d *9/04, 11/10*
U.S. Cl. 5—83 **7 Claims**



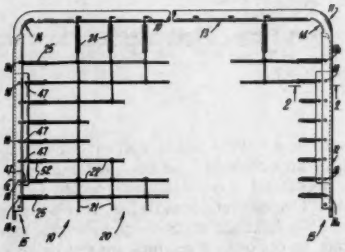
A carrying device for persons who are disabled or ill, including a plurality of hooking members for supporting a person under the arms and behind the shoulders, and

under the thighs, which hooking members are self-closing under the weight of the person to be lifted and which may be placed in position for use by the person himself, either when sitting in a wheelchair or lying in bed; and a lifting device for such carrying means, adapted to be operated by the person who is disabled and is to be lifted, and including means for preventing undesired rotational movements of the carrying device around substantially vertical axes during the lifting of such a person.

3,608,105
FOOT SECTION OF A COLLAPSIBLE PULL-OUT BED

William R. Flatford, Atlantic Highlands, N.J., assignor to Super Sagless Spring Corporation, Bayonne, N.J.

Filed Apr. 16, 1969, Ser. No. 822,846
Int. Cl. A47c *23/08*
U.S. Cl. 5—232 **16 Claims**

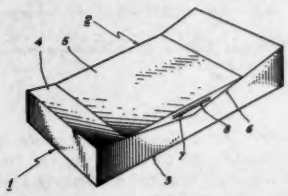


A number of the transverse wires of the mattress supporting spring fabric, instead of being attached by coil tension springs directly to the side rails of the frame of the foot section, are attached to angle shaped side members hinged to and underlying the angle shaped parallel side rails of the frame. Said angle shaped members are swingable inwardly to relax the springs and make for a softer seat. The top flanges of the frame stop angular movement of said angle shaped means upwardly and outwardly to keep the mattress from crowning in the middle.

3,608,106
MATTRESS FOR CLINICAL AND OTHER PURPOSES

Ramon Ordeix Parramon, Barcelona, Spain, assignor to Fabricacion Espanola de Colchones Anatomicos, Sociedad Anonima, Barcelona, Spain

Filed Feb. 12, 1969, Ser. No. 798,604
Claims priority, application Spain, Feb. 21, 1968, 350,735
Int. Cl. A47c *23/00;* **A61g** *7/04*
U.S. Cl. 5—345 **8 Claims**

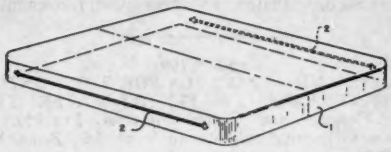


A mattress comprising a lower slab with a flat base and two upper inclined surfaces sloping from the extremities towards the center and an upper slab with a flat top and two lower inclined surfaces sloping from the center towards the extremities, the upper slab being shorter than the lower slab and the inclined surfaces of the upper slab corresponding to those of the lower slab.

3,608,107
MATTRESS SPRING WITH ADJUSTABLE FIRMNESS

Boris Kentor, 6536 Darlington Road 15217, and Theodore E. Anthony, Sr., 208 Rebecca Square 15209, both of Pittsburgh, Pa.

Filed Sept. 24, 1969, Ser. No. 860,644
Int. Cl. A47c *23/04, 25/00*
U.S. Cl. 5—351 **8 Claims**

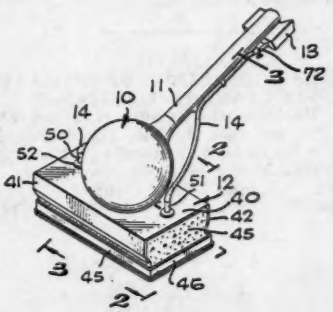


An adjustable coil spring having a top and bottom plate. A plunger depending from the top plate extends into a hollow cylinder mounted to the bottom plate. The cylinder includes a vertical slot and a plurality of recesses and the plunger includes an extending pin which is adapted to ride along the slot and engage one of the recesses for selective control of the spring. Rotation of the cylinder or a plurality of cylinders controls the recess adapted for engagement.

3,608,108
MATERIAL CONDITIONING BY ACOUSTIC ENERGY

Harold T. Sawyer, Pacific Palisades, Calif., assignor of fractional part interest to Vernon D. Beehler, Los Angeles, Calif.

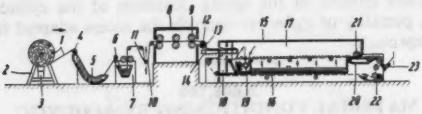
Continuation-in-part of applications Ser. No. 631,736, Apr. 18, 1967, now Patent No. 3,507,695, dated Apr. 21, 1970, and Ser. No. 642,077, May 29, 1967, now Patent No. 3,497,898, dated Mar. 3, 1970, both applications being continuations-in-part of application Ser. No. 480,310, Aug. 17, 1965, now Patent No. 3,357,033, dated Dec. 12, 1967. This application June 11, 1969, Ser. No. 832,180
Int. Cl. B05c *8/04;* **D06p** *7/00*
U.S. Cl. 8—147 **7 Claims**



Sinusoidal vibration is generated by the revolving movement of a motor mass about its eccentric bearing and mounted in a resilient shell and passed through a single bracket to a pedestal on the shell. The pedestal is in alignment with a line perpendicular to the surface of the material to be conditioned and radial with respect to the motor mass. A tool holder on the pedestal is designed to vibrate at near its own natural frequency in the low sonic range and matched to the forcing frequency of the motor mass. A hollow tool is also designed to vibrate at near its own frequency. A conditioning liquid, such as cleaning

fluid or dye, feeds into the hollow tool and with the motor providing the forcing frequency a compressional sound wave is set up in the tool holder and transmitted in a direction perpendicular to the surface through a cellular foam material into the tool, there setting the conditioning liquid into a state of intense cavitation energy, thus causing it to foam as it is driven outwardly through perforations in the tool to the material to be conditioned. The foam continues to be cavitated which subjects the fibers of the material to a transitory vacuum and alternate pressure exposure that frees the fibers of all foreign matter.

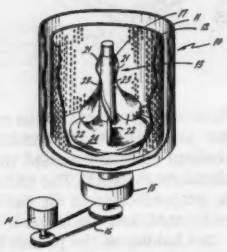
3,608,109
PROCESS AND APPARATUS FOR THE CONTINUOUS TREATMENT OF TEXTILE MATERIALS
Heinz Fleissner and Gerold Fleissner, Frankfurt am Main, Germany, assignors to Vepa AG, Basel, Switzerland
Original application May 15, 1968, Ser. No. 729,178, now Patent No. 3,529,447, dated Sept. 22, 1970. Divided and this application July 30, 1969, Ser. No. 871,144
Claims priority, application Germany, May 24, 1967, V 33,698
Int. Cl. D06c *1/08*
U.S. Cl. 8—149.1 **11 Claims**



The present disclosure is directed to a continuous process for pad dyeing, printing or bleaching textile materials which comprises impregnating the material to be treated with the treatment liquor, and rapidly and uniformly heating-up and setting the material in a treatment chamber with a gaseous or vaporous treatment medium, said treatment medium penetrating the textile material in an upward direction so that the textile material at least partially rests on a steam or gas cushion hereby ensuring proper material shrinkage.

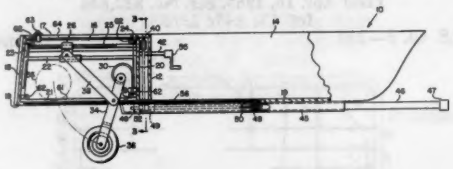
The present disclosure is also directed to an apparatus for performing the above process.

3,608,110
APPARATUS AND METHOD OF OSCILLATING A FLEX-VANE TYPE AGITATOR
James R. Hubbard, Moorestown, N.J., and Elmer C. Vanderslice and John B. Reid, Philadelphia, Pa., assignors to Philco-Ford Corporation, Philadelphia, Pa.
Filed Mar. 9, 1970, Ser. No. 17,598
Int. Cl. D06f *17/08*
U.S. Cl. 8—159 **10 Claims**



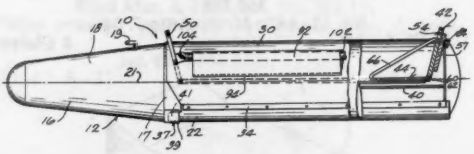
A vertical axis washing machine including a tub, a selectively rotatable basket in the tub, and a rotationally oscillatable agitator within the basket and including vanes of a flexible material having a relatively low modulus of elasticity. Drive means provides short strokes, high-frequency oscillation of the agitator.

3,608,111
BOAT WITH RETRACTABLE TRAILER WHEELS AND HITCH
Robert B. Herden, 428 Woodland Lane, Webster, N.Y. 14580
Filed Oct. 8, 1969, Ser. No. 864,834
Int. Cl. B63c *13/00*
U.S. Cl. 9—1T **10 Claims**



Mounted in a hollow wheel well or housing formed in the back of an outboard type boat, for example, are two, parallel, horizontal drive screws connected to a common drive shaft. Two conventional trailer wheels are connected by collapsible linkages to two drive blocks mounted to reciprocate in opposite directions on the drive screws to shift the wheels into and out of the wheel well through openings in the bottom thereof. A conventional trailer hitch is mounted on the forward end of a retractable beam that reciprocates in and out of a housing on the bottom of the boat. The beam is connected to the drive shaft by a third drive screw which advances or retracts the beam in unison with the trailer wheels. Slidable covers are provided for closing the wheel openings in the wheel well, when the wheels are retracted.

3,608,112
COLLAPSIBLE BOAT
Finn T. Irgens, Milwaukeee, Wis., assignor to Outboard Marine Corporation, Milwaukee, Wis.
Filed May 26, 1969, Ser. No. 827,851
Int. Cl. B63b *7/08*
U.S. Cl. 9—2 **16 Claims**



Disclosed herein is a collapsible boat which includes a pair of inflatable pontoons carried in sleeves. Each sleeve has an upper flexible portion and a lower rigid shell which forms a planing surface. The sleeves are interconnected by a flexible web, and are maintained in spaced parallel relation by a frame assembly which is nested between and secured to the pontoons. The frame assembly includes a bow plate, floorboard and transom adapted to carry an outboard motor. The boat can be disassembled and arranged in a compact, narrow generally cylindrical package with the rigid surfaces of the sleeves forming the outer covers for the package.

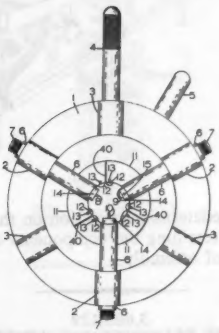
ERRATUM

For Class 9—314 see:
Patent No. 3,608,114

3,608,113
PORTABLE LATHE, TOOL AND DIE DEVICE

Ervin R. Rish, 1815 8th St., and Fredrick Darell Davis, 406 Rocky Lane, both of Cayce, S.C. 29033

Filed Sept. 4, 1969, Ser. No. 855,095
Int. Cl. B23g *5/00, 5/08, 1/28*
U.S. Cl. 10—110 **4 Claims**

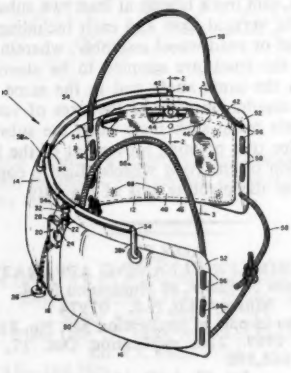


A lathe, tool and die device comprising a primary or carrier ring and nested therein a cam ring whereby the cam ring and the carrier ring can be relatively rotated. The carrier ring further provides a plurality of angularly spaced work bosses, and each of said work bosses is adapted to support a working tool so that when the carrier ring and cam ring are relatively rotated, the working tool holder and thereby the working tool may be converged or diverged about a surface upon which work is to be performed.

3,608,114
INFLATABLE STRUCTURE DEVICE AND METHOD OF INFLATING SAME

William J. Middleton, Felton, and Edward A. Polite, Dover, Del., assignors to ILC Industries, Inc., Dover, Del.

Filed Jan. 6, 1970, Ser. No. 969
Int. Cl. B63c *9/18*
U.S. Cl. 9—314 **6 Claims**

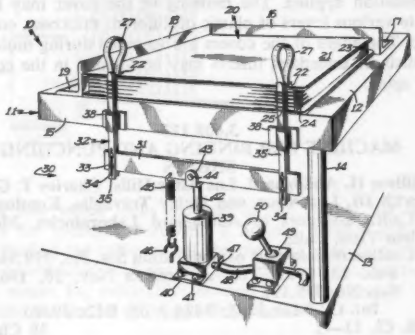


A structure device that is inflatable by vaporization of an inflating material, which includes a bladder having positioned therein a wicking means for dispersing the inflating material as a liquid upon entrance to the bladder to increase the speed of inflating of the structure and a method for inflating the structure, particularly where low-pressure inflating materials are used.

3,608,115
APPARATUS FOR MAKING ALBUMS

Tien S. Chou, Minneapolis, Minn., and Edward L. Libby, Hollywood Hills, Fla., assignors to The Holes-Webway Co., St. Cloud, Minn.

Continuation-in-part of application Ser. No. 774,971, Nov. 12, 1968. This application May 18, 1970, Ser. No. 38,057
Int. Cl. B42c *19/00*
U.S. Cl. 11—1R **10 Claims**



A plurality of album pages are bound to the front and rear album covers by means of a pair of straps which are threaded through slots in the covers and hinge elements on the pages. The pages and covers are positioned on a support so that the hinge elements on the pages are arranged in a pair of registering rows, and a pair of strap engaging members are extended through the recesses defined by the hinge elements to engage one end of each strap, the other end of each strap being secured to one cover. The strap engaging members are then simultaneously shifted in a return direction to simultaneously pull one end of each strap through the hinge elements, the straps then being secured to the other cover.

3,608,116
METHOD AND APPARATUS FOR VACUUM MOLDING BOOK BINDINGS

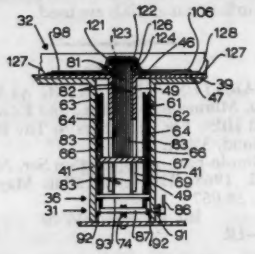
William H. Abildgaard, Los Altos Hills, and Charles T. Groswith III, Palo Alto, Calif., and Hans L. Melgaard, Mound, Minn., assignors to Abildgaard Laboratories Inc., Mountain View, Calif.

Filed June 16, 1969, Ser. No. 833,382
Int. Cl. B42c *19/00, 15/00;* **B42d** *1/00;* **H05b** *1/00*
U.S. Cl. 11—1R **14 Claims**

Vacuum molding apparatus for books comprises a base having a support to hold in assembled position the book pages and book covers and a cap fitting over the spine and a cover containing a heating means and a flexible membrane. The book covers and spine are softened by heat and a vacuum is drawn within the apparatus to cause the membrane to be forced tightly against the spine of the book and the covers, thereby molding as a unit the spine and covers and joining the same to the pages. Means may be provided to avoid formation of fillets where the covers join the spine.

The method involves softening the thermoplastic book covers and spine by application of heat and simultaneously applying a vacuum on the inside of a flexible membrane so that atmospheric pressure forces the membrane

against the covers and spine, molding the same together and joining the spine to the edges of the pages. By use of a prepared casting release paper, simulated grain may be embossed in the covers and various legends and ornamentation applied. The molding of the cover may laminate various layers of plastic of different thickness, colors, etc. The edges of the covers are rounded during molding. Panels or imbedded inserts may be formed in the covers or spine.



3,608,117

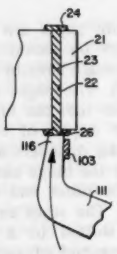
MACHINE FOR BINDING AND PUNCHING SHEETS

William H. Abildgaard, Los Altos Hills, Charles T. Groswith III, Los Altos, and Dalny Travaglio, Kensington, Calif., assignors to Abildgaard Laboratories, Mountain View, Calif.

Continuation-in-part of application Ser. No. 799,045, Feb. 13, 1969. This application Nov. 10, 1969, Ser. No. 875,126

Int. Cl. B42b *5/08;* **B42d** *1/06;* **B42c** *19/00*

U.S. Cl. 11—1 **10 Claims**



An office-type machine is provided for first punching holes in sheets and then binding the sheets to form a book. Used with the machine are two plastic strips, one having longitudinally spaced upstanding studs and the other having holes corresponding in spacing to the studs. The machine has a punch to prepare the sheets. Punched sheets are positioned in the machine on top of the second strip and the studs of the first strip are inserted through the holes in the paper and the holes in the second strip. The strips with the paper therebetween are compressed together. Excess lengths of the studs are cut off by hot blades and rivet-like heads are formed on the severed ends of the studs by heading arms which strike the molten ends of the studs and lock the strips and interposed sheets in assembled position.

3,608,118

APPARATUS FOR ASSEMBLING ARTICLES OF COMMERCE

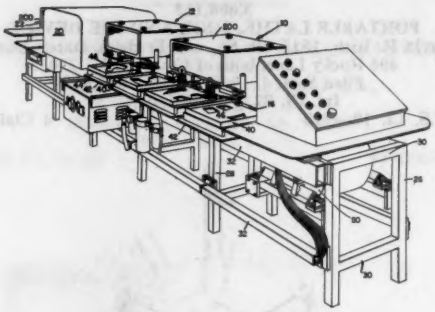
Frederick J. Rex, Jr., North Reading, Adelbert W. Rockwell, Jr., Gloucester, and Leo A. Crowell, Hamilton, Mass., assignors to USM Corporation, Boston, Mass.

Filed May 26, 1969, Ser. No. 827,713

Int. Cl. A43d

U.S. Cl. 12—1 **10 Claims**

Apparatus for assembling a multiple component article of commerce, particularly a shoe upper, comprising an intermittently translated conveyor belt, means for precisely locating components of the article relative to the conveyor belt, means for accurately depositing the components at a predetermined position on the conveyor belt and means for retaining the components on the belt during the period of assembly.



3,608,119

TRUCK FOR TELESCOPING AIRPORT JETTY

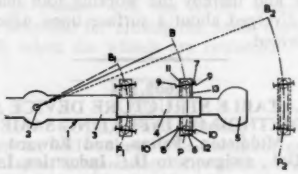
Nicolaas Gradus Jan Willem van Marle, Dordrecht, Netherlands, assignor to Aviolanda Maatschappij voor Vliegtuigbouw N.V., Papendrecht, Netherlands

Filed Mar. 21, 1969, Ser. No. 809,208

Claims priority, application Netherlands, Mar. 22, 1968, 6804096

Int. Cl. B65g *11/00*

U.S. Cl. 14—71 **1 Claim**



A truck for a telescoping airport jetty pivotable about a vertical axis, said truck having at least two substructures steerable about vertical axes and each including at least one road wheel or road wheel assembly, wherein the substructures of the truck are coupled to be steered at all times through the same angle and in the same sense of rotation, the angular position of the axes of rotation of the road wheels being such that, when the substructures are adjusted for true pivoting movement of the jetty, the axes of rotation of the road wheels slightly converge in the direction of the pivoting axis of the jetty.

3,608,120

PAINT ROLLER CLEANING APPARATUS

Edwin N. Seiler, 80 Hunterdon Blvd., Murray Hill, N.J. 07974

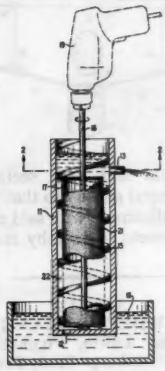
Continuation-in-part of application Ser. No. 813,424, Apr. 4, 1969. This application Oct. 17, 1969, Ser. No. 868,290

Int. Cl. A46b *17/06*

U.S. Cl. 15—1 **12 Claims**

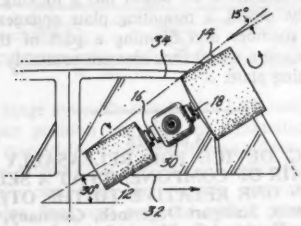
A paint roller cleaning device comprises a hollow cylinder having a helical projection extending from the inner

surface of the cylinder. A paint roller to be cleaned is contained within the cylinder and is rotated by an electric motor or the like. One end of the cylinder extends into a pool of cleaning fluid, and as the roller is rotated, fluid is sucked into the device through one aperture and



expelled through another aperture at the opposite end. As the roller rotates, the helical projection compresses it to squeeze residual paint from it as it is being washed by the cleaning fluid. Methods for making such apparatus are described.

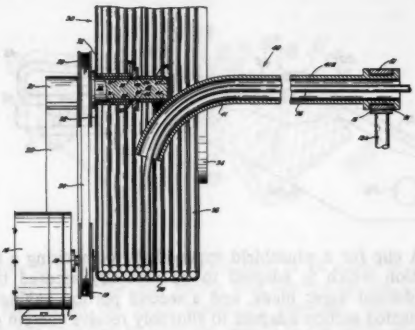
3,608,121
VEHICLE WASHER
Courtland N. Smith, Jr., Glen Ridge, and Sherman L. Larson, Palmyra, N.J., assignors to Sherman Car Wash Equipment Co., Palmyra, N.J.
Filed Mar. 10, 1969, Ser. No. 805,401
Int. Cl. B60s *3/06*
U.S. Cl. 15—21 **3 Claims**



A vehicle washing system having a rotating brush that is angularly displaced with respect to the direction of motion of the vehicle.

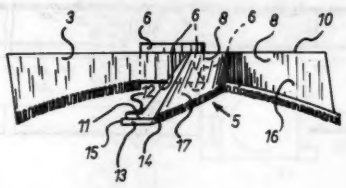
3,608,122
CONDUIT CLEANING APPARATUS
Troy L. Ratliff, 1317 N. Bewley St., Santa Ana, Calif. 92703
Filed Dec. 10, 1969, Ser. No. 883,935
Int. Cl. B08b *9/02*
U.S. Cl. 15—104.3SN **12 Claims**

Conduit cleaning apparatus comprising: a supporting frame; a hollow stub shaft mounted on said supporting frame; a motor and pulley for rotating the stub shaft about its longitudinal axis; a reel adapted for carrying cable, the reel including a cylindrical, hollow hub positionable on the stub shaft and rotatable therewith; and a guide tube, the guide tube including: a substantially straight portion which extends into the stub shaft and restrains axial movement of the reel relative to the stub



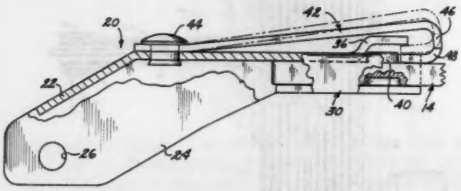
shaft and which locks the hub of the reel to the stub shaft for rotation therewith; a hollow, arcuate portion for guiding the cable out of the reel, the straight portion being connected adjacent one end of the arcuate portion; and means for releasably securing the other end of the arcuate portion to the supporting frame.

3,608,123
HEADLIGHT WIPER
Patrick Champigny, 4454 Levesque Blvd., E., Laval, Quebec, Canada
Filed Apr. 30, 1970, Ser. No. 33,380
Int. Cl. B60s *1/44*
U.S. Cl. 15—250.22 **8 Claims**



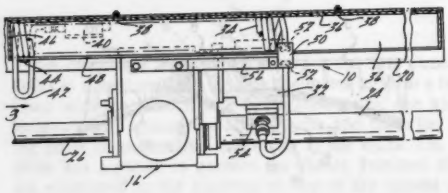
An air-driven rotary wiper for removing dirt from an automobile headlight lens comprising a spindle adapted to be attached to the lens, and an air propeller freely rotatable on the spindle and longitudinally displaceable thereon, said propeller having longitudinally curved vanes defining a downstream curved concave surface which is downwardly and rearwardly inclined, each vane having its edge nearer the headlight lens, provided with a series of straight lens contacting wiping blades, each inclined relative to their circular path, so that successive blades along the vane will move in overlapping circular paths to completely clean the lens while moving the same radially outwardly of the lens. The wiper starts to rotate at low automobile speed despite friction of the blades with the lens surface and the blades are applied to the lens surface with a force increasing with the speed of the vehicle, so that efficient cleaning is achieved and a maximum wiper speed is obtained.

3,608,124
CLIP FOR WINDSHIELD WIPER BLADE
Lester C. Morton, Antrim, Northern Ireland, assignor to National Distillers and Chemical Corporation, New York, N.Y.
Filed Apr. 28, 1970, Ser. No. 32,681
Int. Cl. B60s 1/40
U.S. Cl. 15—250.32 10 Claims



A clip for a windshield wiper blade, comprising a first portion which is adapted to be pivotally secured to a windshield wiper blade, and a second portion having an elongated section adapted to slideably receive therein one end of an actuating arm that is connected at its other end to the drive mechanism for the blade. An external flexible and resilient spring member is secured to the clip and its outer end is adapted to extend over the elongated section in blocking relation to a portion of the arm to retain the arm within clip section. The spring member may be manually lifted out of blocking relation to the arm when it is desired to disconnect the arm from the wiper blade.

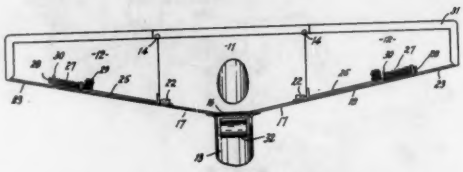
3,608,125
POWER SUPPLY FOR SOOT BLOWERS
John E. Nelson, Lancaster, Ohio, assignor to Diamond Power Specialty Corporation
Filed June 16, 1969, Ser. No. 833,462
Int. Cl. F23j 3/02
U.S. Cl. 15—317 10 Claims



A soot blower having a motor driven carriage mounted for travel along a frame including an elongated guide disposed adjacent to the path of travel of the carriage in which a helically wound conductor is disposed for supplying power to the carriage and which conductor is extensible between a substantially nested compact condition and an open expanded condition in response to the movement of the carriage.

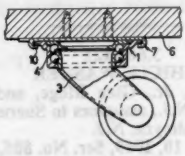
3,608,126
NOZZLE FOR A SUCTION CLEANER
Eelco Tacoma, 20 Elgon Hill, Willeton, Western Australia, Australia, and Ian Crichton Miller, 9 Beverley Terrace, South Guildford, Western Australia, Australia
Filed Apr. 28, 1969, Ser. No. 819,601
Int. Cl. A47l 9/02
U.S. Cl. 15—418 6 Claims

A nozzle for a suction cleaner in which the effective width of the nozzle can be readily reduced to enable normally inaccessible areas to be cleaned said nozzle comprising a central section having a tubular spigot adapted to be connected to said suction cleaner and a pair of wing extensions disposed one on each side of the central section,



characterised in that said wing sections are pivotally mounted on said central section so that they can be folded from a position in alignment with said central section to a position inclined thereto to thereby reduce the width of said nozzle.

3,608,127
CASTER WHEEL ARRANGEMENT
Gunnar Erik Werner Lewin, Viggbyholm, Sweden, assignor to AB Lyckeaborgs Bruk, Torskors, Sweden
Filed Nov. 20, 1967, Ser. No. 684,160
Claims priority, application Sweden, Dec. 2, 1966, 16,521/66; June 2, 1967, 7,736/67; June 30, 1967, 9,906/67
Int. Cl. B60b 33/00
U.S. Cl. 16—30 5 Claims

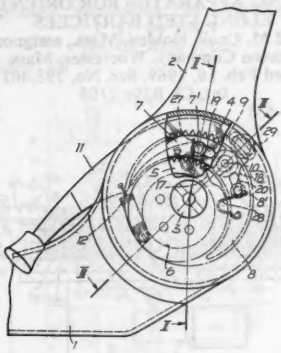


A caster wheel device which is rapidly mountable on and demountable from an object has a locking member secured to the object, a mounting plate engageable with the locking member and forming a part of the caster wheel device and a wheel fork element rotatably mounted in the mounting plate.

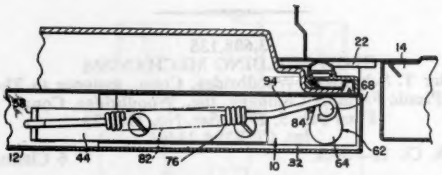
3,608,128
ADJUSTING DEVICE FOR RELEASABLY HOLDING A PAIR OF COMPONENTS AT A SELECTED POSITION ONE RELATIVE TO THE OTHER
Eberhard Faust, Stuttgart-Degerloch, Germany, assignor to Recaro AG, Glarus, Switzerland
Filed Sept. 16, 1968, Ser. No. 759,861
Claims priority, application Germany, Aug. 12, 1968, P 16 80 262.3
Int. Cl. E05d 11/10
U.S. Cl. 16—146 14 Claims

An adjusting device to be used, for example, to releasably hold the backrest of an automobile seat at an adjusted angular position with respect to a lower seat portion, thereof. The device includes a pair of components one of which is movable relative to the other and is to be fixed at an adjusted position with respect to the other component. A pair of lock means coact with these components for releasably holding them in a selected position one with respect to the other. One of the lock means is movable to and from a locking position with respect to the other lock means, and a manually operable means coacts with this one lock means for displacing it between locking and unlocking positions. However, this one lock

means is capable of automatically returning from its unlocking position to its locking position, independently of the manually operable means, in response to a speed of movement of one of the components relative to the other which is greater than a predetermined speed. Therefore, if, when the one lock means is in its unlocking position, one of the components should suddenly move at high speed relative to the other, the one lock means will automatically reassume its locking position to prevent the high-speed movement of the one component.



3,608,129
CAM HINGE ASSEMBLY
John A. Heyer, William H. Wright, and William J. Stahler, Plymouth Meeting, Pa., assignors to Victory Metal Manufacturing Corporation, Plymouth Meeting, Pa.
Filed June 9, 1969, Ser. No. 831,496
Int. Cl. E05f *1/12*
U.S. Cl. 16—190 **8 Claims**

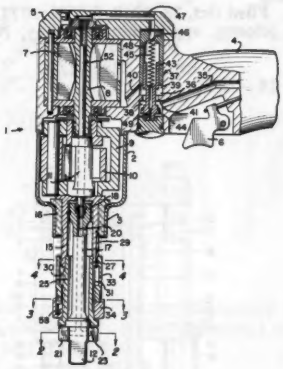


A cam hinge assembly suitable for both retaining a door in the open position and also for automatically closing the door, comprising a housing having a floor and at least one flange extending at right angles above the said floor, a stationary cam assembly pivotally associated with the said housing floor and provided with a spring engaging lug, portions of the said cam assembly binding against the said flange when the door is rotated to the over-open position and a coil spring operatively connected to the said cam assembly at the said lug, the said spring acting to rotate the said door about a cam assembly pivot to thereby bias the door either to its closed position or to its over-open position.

3,608,130
HINGE DEVICE
Jack Rudnick, Bronx, N.Y., assignor to Paniflex Corporation, Bronx, N.Y.
Filed Sept. 22, 1965, Ser. No. 489,212
Int. Cl. E05d *11/08*
U.S. Cl. 16—142 **3 Claims**

A hinge includes a pair of hinge plates having pin coupled interdigitated knuckles formed on rearwardly directed panels located along the hinge plate inner edges. A cam member includes a first leg projecting rearwardly from the inner edge of one hinge plate and terminating in a transversely projecting second leg having an end face located a distance from the hinge pin greater than the radial distance therefrom of the second leg. A leaf spring member is mounted on the second hinge plate and terminates in a leg extending outwardly at an angle to the main section of the leaf spring and bearing on the cam end face when the hinge plates are coplanar. Stop elements are provided to limit the closing of the hinge plates to a coplanar position and staggered apertured coupling tabs project forwardly from the hinge plate inner edges.

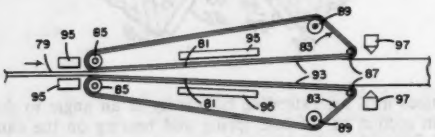
3,608,131
TORQUE CONTROL IMPACT WRENCH
Hanns Hornschuch, Easton, Pa., and Reginald W. Pauley, Belle Mead, and Leo Kramer, Skillman, N.J., assignors to Ingersoll-Rand Company, New York, N.Y.
Filed Oct. 2, 1969, Ser. No. 863,152
Int. Cl. B25b *19/00*
U.S. Cl. 173—12 **11 Claims**



A rotary impact wrench containing a motor, a rotary impact mechanism, and a spindle adapted to drive a fastener. A resilient torsion bar is mounted either between the motor and the impact mechanism or the impact mechanism and the spindle and includes a member for preloading or prewinding the torsion bar so that it does not wind up further until after the torque on the torsion bar exceeds a selected value. A shut-off valve in the wrench is connected to a hollow passage extending through the torsion bar and terminating in an exit port which is normally closed by the preloading means and is opened when the torsion bar winds up further in response to the rise of torque on the torsion bar above the selected

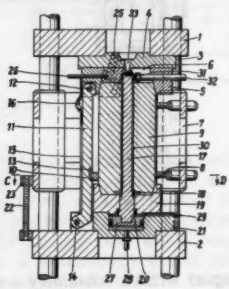
value of torque, resulting in creating a fluid signal which causes the valve to shut off the power supply to the wrench motor.

3,608,132
APPARATUS FOR MAKING ORIENTED, FOAMED ARTICLES
Dorsey C. Nelson, Springfield, and Theodore H. Fairbanks, Liverpool, Pa., assignors to FMC Corporation, Philadelphia, Pa.
Original application Oct. 10, 1967, Ser. No. 674,185, now Patent No. 3,530,761. Divided and this application Aug. 5, 1970, Ser. No. 61,061
Int. Cl. B29d 27/04
U.S. Cl. 18—1FB 4 Claims



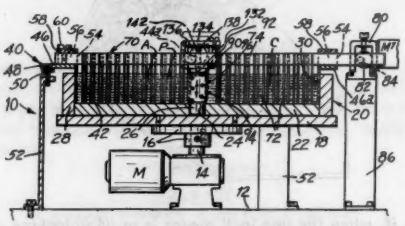
Apparatus for gripping the opposite sides of a foamed article of polymeric material and urge such sides away from each other to effect stretching and orientation of the molecules of the polymeric material in the direction of the article thickness.

3,608,133
MOLD SYSTEM FOR THE PRODUCTION OF ELONGATED HOLLOW INJECTION-MOLDED ARTICLES
Wilhelm Cyriax and Rainer Schutt, Kottingbrunn, near Vienna, Lower Austria, assignors to Battenfeld Maschinenfabriken GmbH Meinerzhagen, Westphalia, Germany
Filed Oct. 28, 1968, Ser. No. 771,063
Claims priority, application Germany, Nov. 3, 1967, P 16 29 720.4
Int. Cl. B29c 11/00
U.S. Cl. 18—2RM 1 Claim



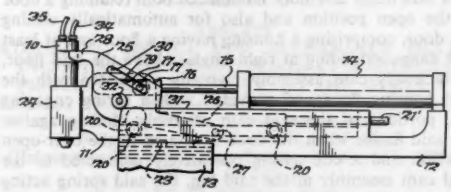
An apparatus for producing long sleeve-like injection-molded articles of uniform cross-section, wherein the article is held by its extenral periphery and by its injector end, in a first mold section in the form of a cavitated body. A core plug, which defines the internal periphery of the molded article, projects through the second mold section into the first. The core plug is first withdrawn from the article, held at two opposite ends in the mold sections and subsequently the second mold section is withdrawn from the article held in the first mold section, finally the article being released by opening the first mold section.

3,608,134
MOLDING APPARATUS FOR ORIENTING ELONGATED PARTICLES
Arnold M. Cook, Holden, Mass., assignor to Norton Company, Worcester, Mass.
Filed Feb. 10, 1969, Ser. No. 798,002
Int. Cl. B29c 1/00
U.S. Cl. 18—5M 11 Claims



A mixture of bond material and elongated abrasive particles and/or reinforcing fibers is placed in a rotatable mold and the mixture is leveled and combed with radially extending combs of uniformly spaced horizontally and vertically extending elements. The combing elements are effective to contact and position the particles and/or fibers in the uncured mix with their long axes parallel and extending radially, circumferentially of, or perpendicular to a given axis so that when the mix is fired or the bond is otherwise activated, the elongated elements will be selectively positioned with respect to a working surface of the completed abrasive tool.

3,608,135
BLOW MOLDING MECHANISM
Peter T. Schurman, Woodbridge, Conn., assignor to The Plastic Forming Company, Inc., Woodbridge, Conn.
Filed Feb. 5, 1969, Ser. No. 796,833
Int. Cl. B29d 23/03
U.S. Cl. 18—5BA 6 Claims



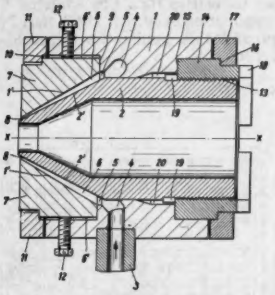
A nozzle carrier movable along a first axis between extended and retracted positions, and a blow nozzle carried by the carrier and movable relative thereto along a second axis into and out of blowing position. The nozzle is connected to the drive through a force multiplying mechanism of increasing ratio as the nozzle approaches blowing position. For top blowing, the carrier and a sectional mold are mounted on a mold support for movement in a generally horizontal plane laterally of the extrusion axis, the extended position of the carrier positioning the nozzle for movement into the top of the mold.

3,608,136

EXTRUSION HEAD WITH RING NOZZLE OF ADJUSTABLE WIDTH ALONG A PORTION OF CIRCUMFERENCE

Hans Tripptrap, Dusseldorf, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 6, 1968, Ser. No. 757,941
Claims priority, application Germany, Sept. 8, 1967, P 17 04 850.9
Int. Cl. B29f *3/00*
U.S. Cl. 18—13H 3 Claims



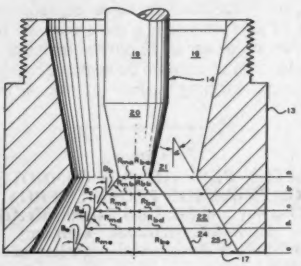
An extrusion head has a casing with a ring nozzle that forms a part of an annular space between the forward end of a mandrel and a surface in the casing. The width of a portion of the circumference of the annular space is adjustable, thereby to vary the thickness of the hollow extruded material encasing an elongated workpiece.

3,608,137

NONPARALLEL LAND DIE

Newton R. Wilson, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Apr. 9, 1969, Ser. No. 814,678
Int. Cl. B29d *23/04*
U.S. Cl. 18—14G 2 Claims



An extrusion die for use in a blow molding apparatus. The die is in the form of a diverging annular opening defined by a pair of nonparallel land areas.

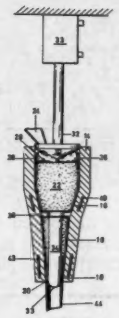
3,608,138

APPARATUS FOR ROLLING AND FORMING ARTICLES

Jacob Marcovitch, Johannesburg, Transvaal, Republic of South Africa, assignor to Rotary Profile Anstalt, Vaduz, Liechtenstein

Continuation-in-part of application Ser. No. 615,613, Feb. 13, 1967, now Patent No. 3,533,259. This application Dec. 22, 1969, Ser. No. 886,994
Claims priority, application Republic of South Africa, Feb. 14, 1966, 66/804
Int. Cl. B29f *3/012*
U.S. Cl. 18—12R 11 Claims

An extruder for continuously extruding articles is provided. The extruder has a body with a nozzle, an open end and conduits joining the open end and the nozzle. The material to be extruded is contained within the extruder body. A number of rollers are received in the open end of the extruder body and roll on the surface of the material. Backing means are also provided against which the rollers roll.

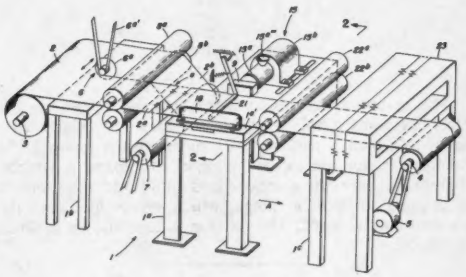


3,608,139

EDGE COVERING APPARATUS

Dale S. Wahlstrom, Mishawaka, Ind., assignor to United States Rubber Company, New York, N.Y.

Original application Feb. 13, 1967, Ser. No. 615,805, now Patent No. 3,491,176, dated Jan. 20, 1970. Divided and this application July 8, 1969, Ser. No. 858,224
Int. Cl. B29f *3/00*; B29d *7/22, 29/00*
U.S. Cl. 18—4P 16 Claims



A method and apparatus for simultaneously forming and applying a cover layer of plastic material to an exposed edge of a belt or the like.

3,608,140

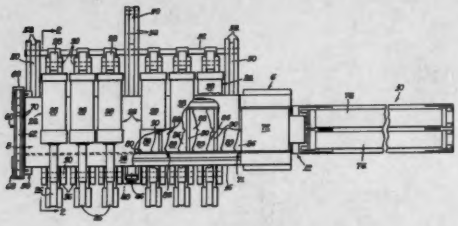
APPARATUS FOR MAKING BRAKE SHOES

Edward Ratcliffe, Mont St. Hilaire, Quebec, Canada, assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Jan. 23, 1969, Ser. No. 793,432
Int. Cl. B30b *11/06*
U.S. Cl. 18—17R 5 Claims

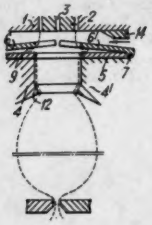
A heated brake shoe press has a longitudinal open end cavity defined by a base and cover. One end of the cavity may be closed by a movable platen. A movable plunger projects into the other end of the cavity and is slideably engaged with the cavity throughout its length. Inserts and liners are slideably engaged in the cavity in a given order and define a plurality of molding cavities that are

fillable with moldable material. The heat, and the pressure exerted by the plunger configures the material in the molding cavities to a shape defined by the inserts and



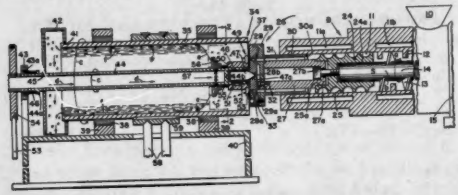
liners. After forming, the platen may be moved to an open position and the inserts and configured material may be pushed out of the cavity by the plunger.

3,608,141
APPARATUS FOR BLOW EXTRUSION
Pierre-Henri Gallay, Neuilly, France, assignor to Mecaplast S.A., Geneva, Switzerland
Original application Aug. 2, 1967, Ser. No. 657,923, now Patent No. 3,548,044. Divided and this application Nov. 6, 1969, Ser. No. 870,815
Claims priority, application France, Aug. 6, 1966, 72,156
Int. Cl. B29c *17/07*; B29d *23/03*
U.S. Cl. 18—5BE **4 Claims**



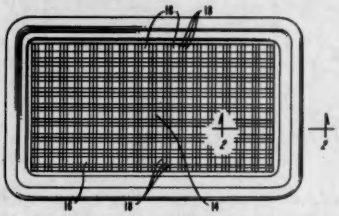
The invention relates to a method and apparatus for blow-extruding a hollow article from a thermoplastic material in which a parison is extruded into a mold. Light pressure is applied to said parison to expand a portion thereof between the extruder and mold and this portion is gripped to form a flange, which serves to locate the parison on the mold. The parison is then blown to form the body.

3,608,142
APPARATUS FOR COOLING PELLETS SEVERED FROM EXTRUDED PLASTIC STRANDS
Richard W. Miler, Saginaw, Mich., assignor to Baker Perkins Inc., Saginaw, Mich.
Filed July 10, 1968, Ser. No. 743,783
Int. Cl. B29f *3/00*
U.S. Cl. 18—12 **7 Claims**



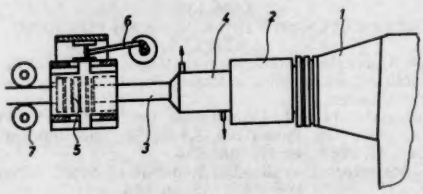
Pelletizing apparatus including a barrel with a mixer shaft therein, a die with axially extending ports for extruding strands of plastic or other extrudable material therethrough, a rotary knife assembly which cuts the strands into pellets, and a rotating pellet collecting housing to which liquid is supplied in a manner to form a centrifugally maintained pellet collecting coolant annulus moving as a stream in a spiral path away from the die.

3,608,143
APPARATUS FOR MAKING FORMED PRODUCTS
Frank C. Schutz, Downey, Calif., assignor to Dart Industries Inc., Los Angeles, Calif.
Original application Aug. 14, 1967, Ser. No. 660,421. Divided and this application Apr. 8, 1970, Ser. No. 31,036
Int. Cl. B29c *17/04*
U.S. Cl. 18—19F **3 Claims**



A means and method for making embossed thermoformed articles particularly adapted for use in forming embossed articles, such as meat trays, and various containers, or packages of material such as foamed styrene plastic or equivalent thermo-plastic material, whereby a vacuum or negative pressure is applied through a perforate mold member at an article forming surface of the mold member so as to vacuum form an embossed surface on the article being manufactured, and particularly during a time when the temperature of the article being formed is sufficient to permit the forming of the material, but insufficient to cause degradation of the cell structure of said material; a die means of the invention, being perforate or made of porous material, permits uniform application of vacuum or negative pressure to an embossed article forming surface of the die means of the invention.

3,608,144
APPARATUS FOR THE CONTINUOUS PRODUCTION OF PRECISION PROFILES FROM PLASTICS
Walter Damsky and Siegfried Joisten, Krefeld, and Janos Sajben, Krefeld-Gartenstadt, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
Filed May 1, 1968, Ser. No. 725,771
Claims priority, application Germany, May 5, 1967, F 52,322
Int. Cl. B29f *3/00*
U.S. Cl. 18—12R **7 Claims**



Apparatus for producing a plastic extruded article having a precision cross-sectional profile. The apparatus

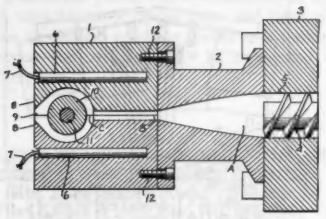
comprises an extruder having a fusion section, a cooling section and a die section. The die section imparts to the extrusion a predetermined cross-sectional profile greater than that ultimately desired. Also included is a cavity cutting tool provided with a plurality of spaced cutting units, positioned adjacent the extruder so as to embrace the extrusion in its path leaving the extruder, and to cut down the oversized profile to the desired precision profile.

3,608,145

APPARATUS FOR MAKING A PLASTIC EXTRUDATE HAVING UNBLOWN OUTER PORTION AND INTEGRAL BLOWN PORTION

Robert F. Baker and Ebon P. Weaver, Naugatuck, Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed July 15, 1969, Ser. No. 841,900
Int. Cl. B29d *27/04*
U.S. Cl. 18—12F **6 Claims**



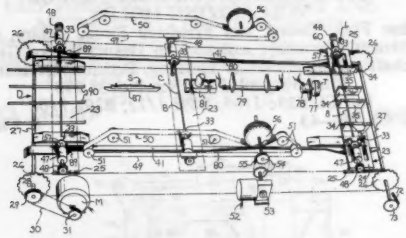
A die and method for plastic extrusion are disclosed herein in which a heater element within the die is maintained at a temperature above the decomposition temperature of a blowing agent incorporated in a plastic melt to be extruded, and the body and exit orifice of the die are maintained at a temperature below the decomposition temperature of the blowing agent.

3,608,146

APPARATUS FOR FORMING PLASTIC TUBULAR ARTICLES

Russell Eugene Dunipace, Perrysburg, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 22, 1968, Ser. No. 723,351
Int. Cl. B29c *17/02, 17/10, 17/14*
U.S. Cl. 18—19TM **9 Claims**



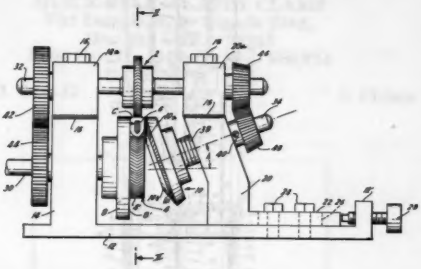
The present disclosure relates to apparatus and method for conveying and transforming tubular thermoplastic blanks into tubular pipets, medicine droppers, burette points, ampuls, and the like, while advancing continuously along a prescribed path. The disclosure has particular utility in forming disposable pipets made of thermoplastic material such as polystyrene and the like.

3,608,147

APPARATUS FOR FORMING INTERLOCKABLE SLIDE FASTENER STRINGERS FROM A COILED FILAMENT

Walter O. Galonska, Great Neck, N.Y., assignor to Henry Rogers, New York, N.Y.

Filed Jan. 23, 1969, Ser. No. 793,362
Int. Cl. B29c *3/00, 15/00, 17/02*
U.S. Cl. 18—19C **12 Claims**



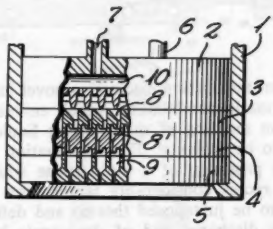
Apparatus for forming interlockable slide fastener stringers wherein a filament loosely coiled over an elongated rod-shaped mandrel is moved in longitudinal direction over an elongated mandrel portion having a cross section larger than the remainder of the mandrel and a substantially oval outline by rotating pressure roll means encompasing the mandrel and the coil thereon in the region of the enlarged mandrel portion, and wherein the pressure roll means and the mandrel portion of enlarged cross section are arranged relative to each other in such a manner so as to deform the coil to provide interlocking heads on the convolutions tthereof adapted to interlock with the heads of a second corresponding coil.

3,608,148

APPARATUS FOR SPINNING A MILTIFILAMENT YARN

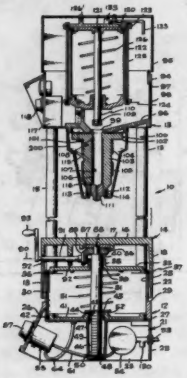
Robert Sluijters, Arnhem, Netherlands, assignor to American Enka Corporation, Enka, N.C.

Filed Feb. 20, 1967, Ser. No. 617,186
Claims priority, application Netherlands, Feb. 25, 1965, 6602465
Int. Cl. D01d *3/00*
U.S. Cl. 18—85C **1 Claim**



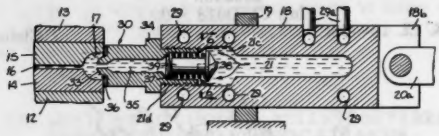
Improved apparatus for producing layered multi-component filaments comprising spinneret means, mixing means immediately upstream of said spinneret means, feed means for introducing spinning masses through filtration means into said mixing means, said mixing means dividing and increasing the component layers prior to terminating into the extrusion orifices of said spinneret means.

3,608,149
INJECTION MOLDING MACHINE
Philip R. Morgan, Monrovia, Calif., assignor to Morgan Industries, Inc., Los Angeles, Calif.
Filed Nov. 6, 1968, Ser. No. 773,736
Int. Cl. B22d *33/04*; D01b *1/10*
U.S. Cl. 18—30LA **6 Claims**



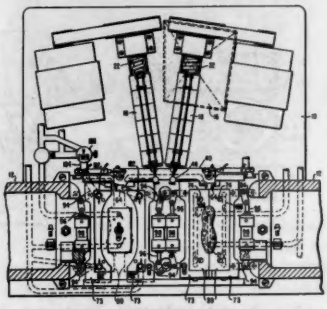
An injection molding machine having a base, an injection head spaced above the base and supported on vertical columns, and a table mounted to move upwardly and downwardly along the columns to clamp a die between the table and the head in injecting position. The table is actuable vertically by a piston and cylinder mechanism within the base, to clamp the die against the injection head, and is adjustable vertically relative to the actuating piston by adjustment of a table supporting screw which extends through and threadedly and adjustably engages the piston.

3,608,150
INJECTION MOLDING OF LIQUID THERMOSETTING RESINS
Leon Laufer, Bayside, and Steve Noto, Brooklyn, N.Y., assignors to Daniel Machlin, Far Rockaway, N.Y.
Filed Jan. 22, 1969, Ser. No. 793,098
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 **23 Claims**



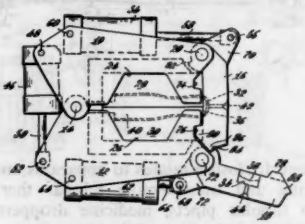
The instant application discloses a novel injection mold sprue and nozzle combination which enables a trouble-free injection molding of quick-curing liquid thermosetting resins to be achieved. The combination is characterized by the provision of a mold sprue which is in the form of a recess considerably larger than the nose of the nozzle to be juxtaposed thereto and defines a hiatus between the discharge end of the nozzle bore and the inlet end of the mold runner system, thereby contrasting with conventional arrangements which are characterized by a flush and tight nozzle to mold fit to bring the nozzle bore and the mold runner system into abutting and directly communicating end to end relation. The depth of that part of the sprue which is not occupied by the nozzle must exceed the depth of the runner system. Thus, since the resin filling the sprue gels inwardly from the walls thereof, the injection pressure can be released and the nozzle separated from the mold before the gelation of the resin in the sprue is completed, thereby avoiding the possibility of the resin gelling back into the nozzle. A check valve is provided in the nozzle system to inhibit after-dribble of resin as well as aspiration of air into the resin supply upon release of the injection pressure.

3,608,151
MOLD COUPLING FOR SOLE INJECTING MACHINES
Oscar H. Cloutier, North Conway, N.H., and Ernest F. Huber, Jr., Beverly, and Wallace W. Ingves, Reading, Mass., assignors to New England Merchants National Bank of Boston, Boston, Mass.
Original application June 12, 1968, Ser. No. 736,308. Divided and this application July 28, 1969, Ser. No. 845,199
Int. Cl. B29f *1/00*
U.S. Cl. 18—30US **10 Claims**



A shoe bottoming machine having a divided mold ring with interface grooves between its halves to form an injecting sprue, so arranged that a block on a plasticizing pump for forcing elastomer into the mold ring is releasably engaged to form a coupling with keys on the mold ring halves whenever they are brought together to form a molding cavity. The keys are supported on parts of a two-part carrier and the block is connected through a distributing manifold between the pump and the block in a manner to enable release of a sprue plug while attached to a molded shoe bottom from the mold ring when the mold ring parts are separated.

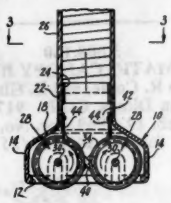
3,608,152
MOLD CARRIER FOR INJECTION OR VULCANIZING MOLDS
Lothar Fink, Baden, and Friedrich Koch, Achim, near Bremen, Germany, assignors to Desma-Werke Gesellschaft mit beschrankter Haftung, Bremen, Germany
Filed May 18, 1970, Ser. No. 38,293
Int. Cl. B29c *1/00*; B29f *1/12*; B29h *7/08*
U.S. Cl. 18—43 **8 Claims**



A mold carrier comprising two side parts pivotally connected at one end for movement of the parts toward and from each other and third and fourth end parts pivotally

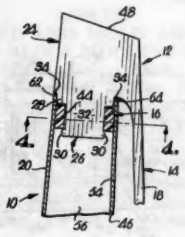
connected to the respective opposite ends of the side parts which are alternatively engageable with the ends of the two side parts to provide an enclosure for holding the component parts of a mold assembly clamped together. There are shoulders on each of the end parts engageable with notches on the side parts by means of which each end part when disposed across the ends of the side parts is adapted to hold the side parts clamped together, while the other end part is disposed in a lateral, inoperative position. There is a cylinder and piston assembly including a piston rod operably connected to the side parts to move them toward and away from each other and cylinder and piston assemblies including rods connecting the side and end parts for moving the end parts into and out of engagement with the side parts. Additionally, there are auxiliary locking means comprising at each side a link pivotally connected to the end of the piston rod at that side and a latch plate pivotally connected to the side part having a notch at one end adapted to engage the pivot connecting the link to the piston rod by extension of the latter to move the adjacent ends of the lever and latch plate beyond the line of centers of these pivots to a locking position whereupon the cylinder may be exhausted without unlocking the parts.

3,608,153
DEVICE FOR REMOVING WOOL FROM SHEEP
Dale L. Berrett, Calistoga, Calif.
(Rte. 1, Arrington, Tenn. 37014)
Filed May 21, 1969, Ser. No. 826,396
Int. Cl. C14b *19/00*
U.S. Cl. 19—2 **1 Claim**



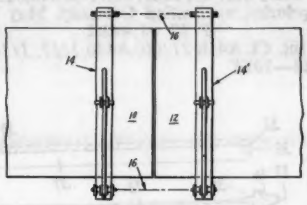
Oppositely rotating grooved rollers pull from the sheep, wool which has been rendered loose or brittle, for example, by the administration to the sheep of certain chemicals now in use, and the rollers supply the wool to a flexible pipe leading to a source of vacuum for collecting the wool.

3,608,154
CLIP FOR WRITING INSTRUMENT AND METHOD OF ATTACHING SAME
George O. Ira, Prairie Village, Kans., assignor to Hallmark Cards, Incorporated, Kansas City, Mo.
Filed Oct. 7, 1969, Ser. No. 864,471
Int. Cl. B43k *25/00*
U.S. Cl. 24—11F **8 Claims**



A clip assembly for attachment to the hollow cap of a writing instrument, such as a pen or pencil, the clip assembly including a clip having a base portion and a resilient shank portion, there being a projection on the base portion which extends through an opening in the normally upper end of the cap, the projection being engaged by a resilient retainer ring which is frictionally fitted within the hollow cap, whereby the clip assembly is retained with respect to the cap.

3,608,155
QUICK-RELEASE BELT CLAMP
Virl Burgess, 6180 Lincoln Blvd., Oroville, Calif. 95965
Filed Oct. 16, 1969, Ser. No. 866,924
Int. Cl. F16g *3/00*
U.S. Cl. 24—32 **6 Claims**



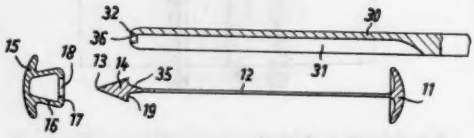
A quick-release belt clamp assembly; generally usable in pairs to draw together terminal ends of conveyor belts or the like in which each clamp assembly comprises a pair of juxtapositionable clamp plates hingedly connected in spaced relation at one end, and in which a toggle-clamp is hinged at the other end of one of the plates and clampingly and detachably engageable over the other end of the other plate for releasably clamping the plates on a belt end; in which the toggle clamp includes an L-shaped lever including an antifriction roller and in which releasable lock means is provided to prevent accidental release of the belt-clamp assembly; and in which the assembly includes anchor means whereby pairs of cooperating assemblies, after being mounted on belt ends, can be readily drawn together.

3,608,156
LABEL HOLDING AND DISPENSING DEVICE
Gus Graham Ward, Fayetteville, N.C., assignor to Rohm and Haas Company, Philadelphia, Pa.
Filed Apr. 22, 1969, Ser. No. 818,348
Int. Cl. A44b *21/00*
U.S. Cl. 24—81B **5 Claims**

The device is of one-piece construction and is formed of spring steel provided with a thermoplastic coating. The main body portion of the device has an attaching portion at one end thereof comprising a plurality of spaced resilient hook-shaped portions adapted to be connected to an

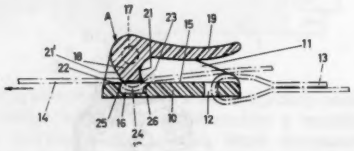
associated spinning sleeve. A holding leg extends from the opposite end of the main body portion and is resiliently biased toward the main body portion for holding labels between the holding leg and the main body portion. This holding leg is provided with a slot so that a person's finger can engage the labels to dispense the labels, and the end of the holding leg extends laterally so as to permit the holding leg to be readily moved away from the main body portion.

3,608,157
DEVICE FOR BUTTON TUFTING CUSHIONS FOR CHAIRS AND MATTRESSES
Otto Paul Molt, 7061 Haubersbronn, Wurttemberg, Germany
Filed May 15, 1969, Ser. No. 824,813
Claims priority, application Germany, May 17, 1968, P 17 60 443.2
Int. Cl. A41h *31/00;* **A44b** *1/12, 1/18*
U.S. Cl. 24—102T **14 Claims**



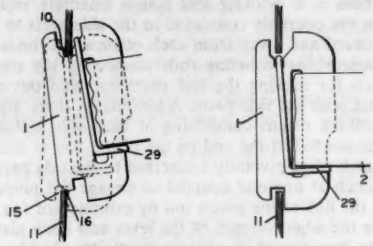
Button tufting device for pads such as, for example, cushions, mattresses and the like articles consisting of an elongate flexible element having a tufting button integrally formed on one end thereof and a pointed headpiece integrally formed on the other end thereof moulded of suitable plastic material, and a companion button to be snapped on the headpiece in push-button like manner after the element had been pulled through the pad with the aid of a stiff needle or similar tool.

3,608,158
BUCKLE
Sigurd Walter Bengtsson, 17 Bruksgatan, 414 51 Goteborg, Sweden
Filed Mar. 20, 1969, Ser. No. 808,810
Claims priority, application Sweden, Mar. 21, 1968, 3,811/68
Int. Cl. A44b *11/12*
U.S. Cl. 24—170 **1 Claim**



The buckle is for the interconnection of two band parts and has a base plate with side flanges, an opening and recess and a double arm lever pivotally mounted between side flanges. One band part is attached to said base through said opening and the other band part extends between said base and said arm whereby pivoting of said arm in one direction causes said second band part to be bent into said base recess with two spaced locking edges of said arm engaging said second band bent portion above side edges of said base recess to retain said second band part on said buckle.

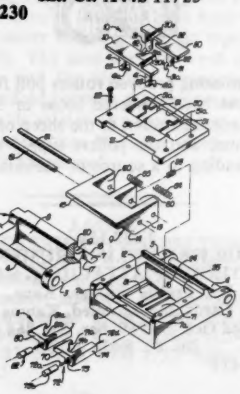
3,608,159
END CONNECTOR MEMBER
Henry J. Brucker, Summit, N.J., assignor to Suburban Metal Industries Limited, Scarborough, Ontario, Canada
Filed May 5, 1970, Ser. No. 34,664
Claims priority, application Canada, June 3, 1969, 53,359
Int. Cl. A44b *17/00;* **A44c** *5/18*
U.S. Cl. 24—201 **10 Claims**

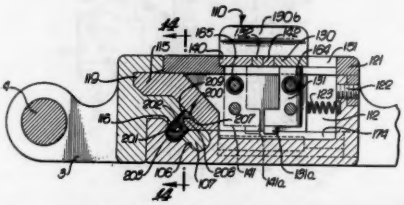


The invention relates generally to material handling equipment and in particular to an end connector for releasably securing a cargo supporting or restraining strap to an anchor member mounted, for example, on the inside wall of a truck or other cargo container.

The end connector is in the form of a metallic or like plate to which the strap is fastened in any desirable manner, and an adjustable wire keeper is loosely mounted on the plate, the keeper adapted to securely releasably lock the end connector to the anchor member.

3,608,160
AUTOMATIC CANOPY BUCKLE
Jan R. Coyle, 514 E. Ghent, San Dimas, Calif. 91773
Filed Feb. 19, 1969, Ser. No. 800,398
Int. Cl. A44b *11/25*
U.S. Cl. 24—230 **13 Claims**

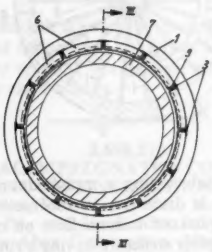




A failure safe buckle in which a lug of a male buckle part is captured in a recess of a female buckle part by a

latch slide, the latch slide being releasably locked in a position overlying the recess and engaged with the lug, and in which the lock mechanism includes relatively movable parts biased to locking positions to lock the latch slide against movement, the relatively movable parts requiring simultaneous opposite movement to permit shifting of the latch slide to a position releasing the lug, and cams acting on such relatively movable parts to move the same in response to firing of explosive charges in the buckle. Such a buckle in which the explosive charges are ignited by closure of a remote switch.

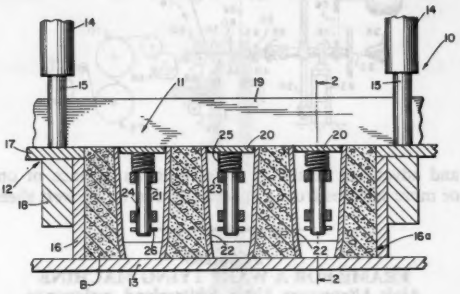
3,608,161
CLAMPING MEANS FOR CLAMPING AND HOLDING HOLLOW BODIES PARTICULARLY TUBES
Erwin Kost, Osterath, and Bernhard Zeuch, Dusseldorf, Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany
Filed Apr. 29, 1970, Ser. No. 32,818
Claims priority, application Germany, May 2, 1969, P 19 22 497.6
Int. Cl. B23b *31/30*
U.S. Cl. 24—263IH **6 Claims**



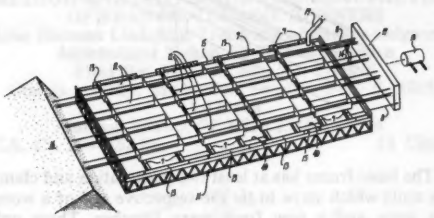
Clamping means for clamping and holding hollow bodies, such as tubes, against either inwardly or outwardly acting fluid pressure, comprising a cylindrical resilient sealing sleeve, a gripping member consisting of annularly arranged segmental clamping pieces of a material harder than that of the sealing sleeve, slightly spaced apart, supporting means being provided for holding the segmental sealing pieces in their annular position when the fluid pressure is released. The gaps between the segmental clamping pieces are each covered throughout its length by a plate, moulded in or stuck onto the sleeve material, each plate being given a T-shaped profile by the addition of a web extending perpendicularly from the plate into the gap.

3,608,162
VENTED CORE AND MOLD ASSEMBLY FOR CONCRETE BLOCK MOLDING MACHINES
Charles A. Staton, Alpena, Mich., assignor to Besser Company, Alpena, Mich.
Filed Dec. 13, 1968. Ser. No. 783,655
Int. Cl. B28b *7/18*
U.S. Cl. 25—41A **8 Claims**

A vnted core and mold assembly for concrete block molding machines wherein a core plate which is vertically separable from a mold box supporting pallet has core shell covers fixed thereto which support core shells for relative vertical movement therewith, vertical separation of the core plate causing a vertical separation of the core cover plates and core shells which are restrained by the frictional resistance of the cementitious material in the mold box and the vacuum created by the withdrawal of the core shells to thus open up the tops of the core shells to atmospheric pressure and break the vacuum created.



3,608,163
APPARATUS FOR PRODUCTION OF PRE-STRESSED MOLDED CONCRETE MEMBERS
Jon W. Harford, Petaluma, Calif., assignor to J. H. Pomeroy & Co., Inc., San Francisco, Calif.
Filed July 7, 1969, Ser. No. 840,140
Int. Cl. B28b *13/06*
U.S. Cl. 25—120 **4 Claims**

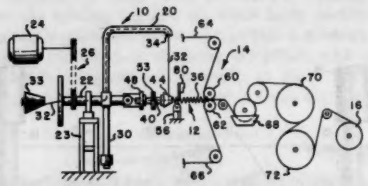


In the manufacture of pre-stressed molded concrete members a lifting machine characterized by a laterally extending rigid bar at each end which can be lowered into engagement with the projecting stubs of the cable ends extending out of the molded member. The means for elevating these two transversely extending rigid bars serves first to eliminate all slack from the hoisting means coupled to the bars. Thereafter, the bars are elevated evenly so as not to introduce a twisting moment to the molds or members.

3,608,164
APPARATUS FOR PRODUCING NONWOVEN FABRICS
Milton M. Bolles, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed Sept. 11, 1969, Ser. No. 857,037
Int. Cl. B32b *31/12*
U.S. Cl. 28—1CL **4 Claims**

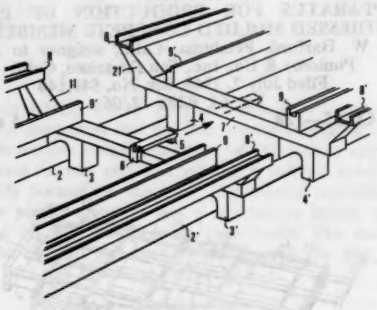
Apparatus for producing nonwoven net fabric comprising means for winding a continuous thread about spaced support members to form a plurality of thread sections therebetween and for advancing the sections in spaced, generally parallel relation to form a weft sheet which is subsequently combined with one or more warp thread sheets to form a composite nonwoven net fabric

and control means for sensing the presence of thread sections in the weft sheet and for stopping the winding



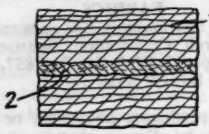
and advancing means in response to an absence of one or more sections from a spaced position in the weft sheet.

3,608,165
FRAME FOR A WARP TYING MACHINE
Alois Altenweger, Uster, Switzerland, assignor to Zellweger Ltd., Uster, Switzerland
Filed Oct. 3, 1969, Ser. No. 863,536
Claims priority, application Switzerland, Oct. 4, 1968, 14,915/68
Int. Cl. D03j *1/18*; D02h *11/00*
U.S. Cl. 28—49 **6 Claims**



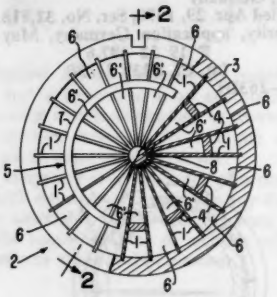
The basic frame has at least two preparation and clamping units which serve to tie the respective end of a woven out warp and a new fresh warp together. These units are separately mounted on the basic frame to be removed one at a time so as to be consecutively placed behind each other to extend the guide path for the warp tying machine.

3,608,166
METHOD OF PRODUCING PADS OR MATS OF MINERAL FIBERS
André Gruget, Meudon, France, assignor to Compagnie de Saint-Gobain, Neuilly-sur-Seine, France
Filed Apr. 18, 1969, Ser. No. 817,430
Claims priority, application France, May 2, 1968, 150,268
Int. Cl. D04h *18/00*
U.S. Cl. 28—72.2R **5 Claims**



The production of a mat of glass fibers of improved structural integrity, cohesiveness, increased density, resilience and tractive resistance in longitudinal and transverse directions by combining with the mat a thin layer of connecting fibers having stretch and pliability characteristics greater than those of the glass fibers, and "needling" the combined mat with needles provided with barbs which entrain the connecting fibers into the mat in a transverse direction relative to the mat surfaces, which bind the glass fiber into a well integrated mat useful for thermal and acoustic insulation, structural members, laminates for fabric and other sheet material, packing plastic reinforcements, filters, and other industrial applications.

3,608,167
METHOD FOR FABRICATING A "RISING SUN" MAGNETRON ANODE
Leonard Safran and John B. Horrigan, Beverly, Mass., assignors to Varian Associates, Palo Alto, Calif.
Filed Nov. 12, 1969, Ser. No. 875,656
Int. Cl. H01j *9/00*
U.S. Cl. 29—25.14 **6 Claims**

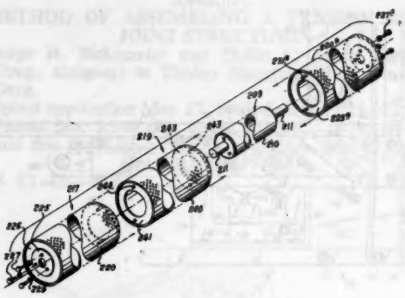


A method for fabricating a molybednum "rising sun" magnetron anode is disclosed. In the method, the radial array of vanes is brazed intermediate an outer ring and an inner post. A spider structure having a ring shaped body with dependent axially directed leg portions is brazed to the vanes with the leg portions being located in every other space between adjacent vanes to form a rigid self jigging structure. Once brazed, the center post, adjacent vane tips and ring portion of the spider are removed to define a "rising sun" anode configuration.

3,608,168
SECTIONAL HOLLOW FILE CONSTRUCTION
James A. Coon, 929 Drever St., West Sacramento, Calif. 95691, and Elwin Theobald, 4631 Solano Way, Fair Oaks, Calif. 95628
Filed Oct. 3, 1969, Ser. No. 863,607
Int. Cl. B23d *71/00*
U.S. Cl. 29—79 **10 Claims**

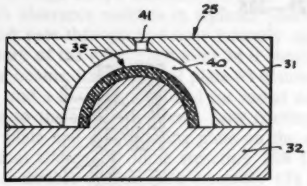
Various standardized shaped sections, each having a U shaped portion on one end and an angle formed on the opposite end for snapping together in constructing hollow files of a desired size and shape. Raised portions and projecting tabs at the section ends are two embodiments that prevent sliding when the sections are snapped together.

3,608,169
ROLLER STRUCTURE
James W. Pace, 644 E. Arawe Circle, Irving, Tex. 75060
Original application June 28, 1967, Ser. No. 649,642, now Patent No. 3,440.842. Divided and this application Oct. 1. 1968, Ser. No. 798,491
Int. Cl. B60b 7/04
U.S. Cl. 29—125 4 Claims



A perforated roll element is mounted on and spaced from a tubular support and comprises a plurality of perforated, annular sections which mate and are clamped together at their end portions.

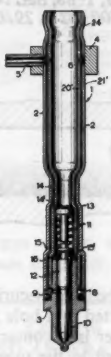
3,608,170
METAL IMPREGNATED COMPOSITE CASTING METHOD
Hugo R. Larson, Ridgewood, N.J., Henry M. T. Harris, Meadville, Pa., and Jacob Nitz, Maple Heights, Ohio, assignors to Abex Corporation, New York, N.Y.
Filed Apr. 14, 1969, Ser. No. 815,819
Int. Cl. B21d 53/10; B22d 23/00
U.S. Cl. 29—149.5PM 6 Claims



Composite metal-non-metal structures are obtained by first molding a porous perform of the non-metal in particulate form using a binder which will bond the particles by pyrolysis phenomenon. The preform is then transferred to a mold where it is thoroughly impregnated by molten metal.

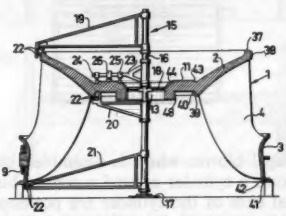
3,608,171
METHOD OF MAKING FUEL INJECTION VALVE
Gunther Stradtmann, Bamberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Dec. 16, 1969, Ser. No. 885,593
Claims priority, application Germany, Dec. 18, 1968, P 18 15 260.8
Int. Cl. B21k 1/20
U.S. Cl. 29—156.7R 8 Claims

There is described a fuel injection valve which is made in the following manner: two metal strips, one of which is provided on one face with parallel extending longitudinal grooves, are superposed in registry and with the grooved face covered. Thereupon the strips are bent as a unit to form a double-jacketed tubular body which is subsequently welded and cut into required lengths. Annular



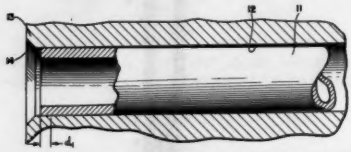
inlet and outlet grooves are provided in said body to communicate with internal longitudinal fuel channels formed by said longitudinal grooves. By means of rolling operations, the ends of said fuel channels are sealed and further, circumferentially reduced areas are provided in said valve body for positioning valve components therein.

3,608,172
METHOD AND DEVICE FOR THE MANUFACTURE OF FRANCIS TURBINE RUNNERS
Arne Herman Lindquist, Trollhattan, Sweden, assignor to Aktiebolaget Nohab, Trollhattan, Sweden
Filed Jan. 31, 1969, Ser. No. 795,545
Claims priority, application Sweden, Feb. 5, 1968, 1,479/68
Int. Cl. B21k 3/04; B23p 15/02, 15/04
U.S. Cl. 29—156.8R 12 Claims



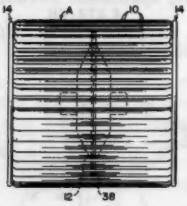
A re-finished and annealed Francis-type runner is finished by first machining a guide structure and surface on the hub of the runner to selected final dimensions. Such machining is effected by mounting the center shaft of a machine tool so that it is coaxial with the hub and the rim of the runner and so that the finishing tool carried by the machine tool is in coacting relationship with the guide structure and surface to be machined for finishing. This machine tool is then removed and a second machine tool is mounted on the guide structure and surface finished with the first machine tool. Correct location of the second machine tool is effected by utilizing the finished areas of the structure and the surface as reference areas. The second machine tool also mounts a finishing tool by means of which further guide structures and surfaces on the hub and the rim of the runner are machined to selected final dimensions whereupon the second machine tool is also removed.

3,608,173
METHOD FOR SECURING A TUBE IN A TUBESHEET
James F. Watson, La Jolla, and Stanley L. Koutz and Lawrence J. Hull, San Diego, Calif., assignors to Gulf Energy & Environmental Systems, Inc., San Diego, Calif.
Filed Nov. 19, 1968, Ser. No. 777,036
Int. Cl. B21d *53/00;* **B21k** *29/00;* **B23p** *15/26*
U.S. Cl. 29—157.4 **2 Claims**



A method is described for securing a tube in a tube sheet. The tube is inserted in a hole in the tube sheet and is expanded with a taper into contact with the tube sheet. The tube is then bonded to the tube sheet at its end and is further expanded with a taper subsequent to bonding.

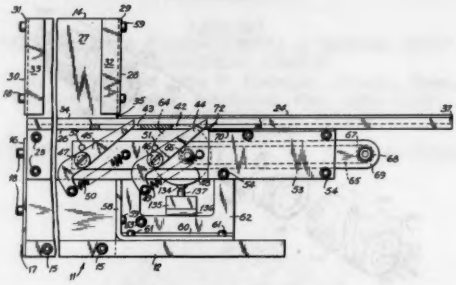
3,608,174
APPARATUS FOR ASSEMBLING CENTRIFUGAL BLOWERS
Harold L. Baker, Warrensville Heights, Ohio, assignor to Morrison Products, Inc., Cleveland, Ohio
Continuation-in-part of application Ser. No. 649,616, June 28, 1967. This application Jan. 8, 1969, Ser. No. 789,675
Int. Cl. B21k *3/04;* **B23p** *15/02, 15/04*
U.S. Cl. 29—156.8 **10 Claims**



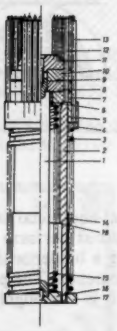
A centrifugal blower wheel is assembled by forming a blade strip into a cylinder around a central hub disc. The circular axial ends of the cylinder are positioned in channel-shaped circular end rings. An axial force is applied to the assembly and the end rings are simultaneously deformed into gripping engagement with the cylinder ends. The central hub disc has a bifurcated outer periphery which is deformed outwardly into engagement with notches in the blades subsequent to deformation of the end rings.

3,608,175
SYSTEM FOR THE STORAGE, TRANSPORTATION AND FEEDING OF ELECTRONIC COMPONENTS
Richard A. Lambrecht, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.
Filed Dec. 29, 1969, Ser. No. 888,436
Int. Cl. H05k *13/04*
U.S. Cl. 29—203B **18 Claims**

System for storage, transportation and feeding of electronic components onto hybrid circuit substrates including apparatus consisting of component carrying trays and tray handling apparatus, said trays having component holding means spaced along one surface thereof and a series of teeth spaced along the tray in predetermined relationship with the component holding means on the tray, said tray handling apparatus consisting of an open-bottomed magazine for containing a stacked plurality of said trays, a track extending from said magazine to a tray unloading station, a first tray progressing means operative to slidably actuate the lowermost tray out of the magazine, a second tray progressing means located between the magazine and the unloading station, said second tray progressing means operative to engage teeth on the tray for moving said tray intermittently along the track in increments equal to the spacing between the components on the tray and to position said components seriatim at the unloading station, and drive means for operating the two tray progressing means in synchronization with each other.



3,608,176
APPARATUS FOR MOUNTING COILS IN STATORS OF ELECTRIC MACHINES
Karl-Heinz Wieckhorst, 25 Klipperstrasse, Lubeck, Germany
Filed Apr. 24, 1969, Ser. No. 818,908
Claims priority, application Germany, Apr. 25, 1968, P 17 63 258.5
Int. Cl. H02k *15/06*
U.S. Cl. 29—205 **13 Claims**



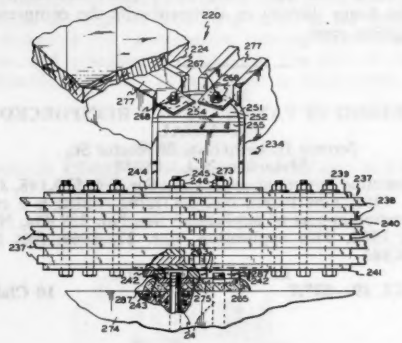
Prefabricated coils for a stator of an electric machine are placed on guide needles extending in parallel relation to each other and arranged in form of needle cages on two concentric pitch circles of different diameters, the pitch circle diameter of the outer needle cage which encircles the inner needle cage in the initial position is greater than the bore diameter of the stator while the diameter of the circle circumscribing the inner needle cage is smaller than the bore diameter of the stator, the needle cages being movably guided relative to each other

and are shiftable by drive means coaxially to the axis of said stator in a direction towards the stator bore wherein the movement of the outer needle cage is limited by the needles of the outer cage engaging the teeth of the package of stator plates formed by the grooves when the inner needle cage is entering the stator bore and thereby drawing the coils in axial direction into the stator grooves.

3,608,177
METHOD OF ASSEMBLING A TENSION RING JOINT STRUCTURE

George R. Birkemeier and Hollis C. Scott, Portland, Oreg., assignors to Timber Structures, Inc., Portland, Oreg.

Original application May 17, 1968, Ser. No. 729,952, now Patent No. 3,540,174, dated Nov. 17, 1970. Divided and this application Nov. 3, 1969, Ser. No. 873,213
Int. Cl. B23q *17/00*
U.S. Cl. 29—407 2 Claims



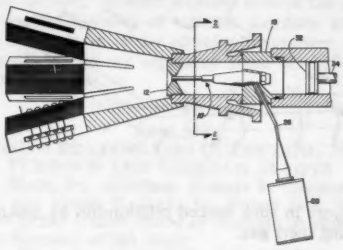
A dome structure **20** (FIGS. 1 to 5) includes beams connected together in triangles by joints **31** and **32** and connected to a tension ring by joints **34**. In each joint **31**, bolts pass through straps connected to the beams and pass through clearance notches in stiffener plates welded to a tube and pass through and bear laterally against the inner periphery of the tube. Each joint **34** is similarly connected to the beams, has a vertical plate **63** connected to a tension ring and a base plate splined for radial movement only relative to the supporting wall. Low friction facings on the base plate and a supporting plate on the wall permit easy radial sliding. A dome structure **120** (FIGS. 6 and 7) has a double tension ring assembly **131** and has joints **134** in which bolts connect the beam straps of stiffening plates and pass through and bear against close-fitting holes in the stiffening plates, which holes are spaced inwardly from the inside faces of tubes of the joints. In a dome structure **220** (FIGS. 8 and 10), a laminated tension ring is provided. In a dome structure **320** (FIGS. 11 and 12) a series of straps welded together in the same plane connect at least three beams to a joint, and shear plates also connect the beams to the joint.

3,608,178
PROCESS FOR PRODUCING ELONGATED OBJECTS FROM POWDERED METALS

Herbert Kartluke, Harold Lawrence McKaig, Jr., and William B. Tarpley, Jr., West Chester, Pa., assignors to Aeroprojects Incorporated, West Chester, Pa.

Filed Nov. 25, 1969, Ser. No. 879,643
Int. Cl. B22f *3/24*
U.S. Cl. 29—420.5 12 Claims

One or more powdered metals, elemental or alloy, are mixed with a plasticizer and binder. The mixture is extruded into solid or hollow shapes using an ultrasonically activated extruder. The shape is then dried and sintered. Thereafter, the sintered shape is cold worked, such as

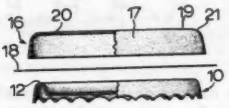


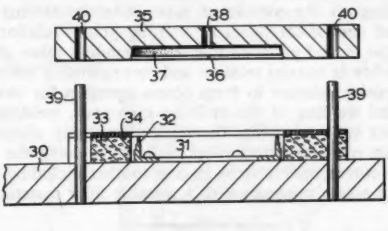
by drawing the shapes on an ultrasonically activated draw bench, to increase its density and mechanical properties.

3,608,179
METHOD AND APPARATUS FOR THE MANUFACTURE OF MIRRORS

Herbert Jeffree, Byfleet, Surrey, and George Y. Benzies, Woking, Surrey, England, assignors to British Aircraft Corporation Limited, London, England

Filed Jan. 24, 1969, Ser. No. 793,798
Claims priority, application Great Britain, Jan. 31, 1968, 4,974/68
Int. Cl. B23p *11/02*
U.S. Cl. 29—446 10 Claims





A method and apparatus are described for producing mirrors with a reflecting surface of a thin flexible reflecting material in which a sheet of the reflecting material is stretched over a backing member having a raised peripheral ridge by gripping an outer zone of the sheet and drawing it down around the backing member, and an outer ring is subsequently fitted over the peripheral ridge of the backing member so as to trap the sheet between the outer ring and the backing member.

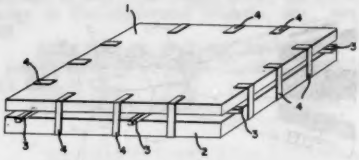
3,608,180
COMPRESSED GAS STANDOFF FOR CLADDING

William F. Sharp, Jr., Bellmawr, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of application Ser. No. 707,522, Feb. 23, 1968. This application May 7, 1970, Ser. No. 35,437
Int. Cl. B23k *21/00*
U.S. Cl. 29—470.1 5 Claims

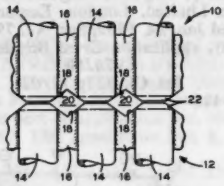
In the process for metallurgically bonding metal layers by arranging them in spaced relationship and then explo-

sively causing them to collide progressively under bonding conditions, the improvement comprising supporting the



metal layers in such spaced relationship by means of an intervening inert gas.

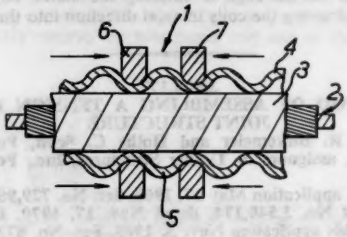
3,608,181
FABRICATION OF PANEL WALLS
Nicholas G. Popov, Darien, Conn., assignor to The Babcock & Wilcox Company, New York, N.Y.
Filed Nov. 18, 1969, Ser. No. 877,714
Int. Cl. B23k *31/02*
U.S. Cl. 29—472.1 **4 Claims**



A method of joining two tube panels each including parallel, laterally adjacent tubes having their intertube spaces closed by metallic webs comprising, providing at one end of one of the tube panels notches in the webs extending to the associated tube ends, positioning the notched end of the panel in abutting planar relationship with the second panel so that corresponding tubes of the panels are in coaxial relation and corresponding webs are in opposing relation to form access openings for circumferential welding of the abutting tube ends, welding the abutting tube ends together circumferentially about the junction of the abutting tubes, and seal welding the ends of the corresponding webs to one another including closing the access openings with a metallic filler material.

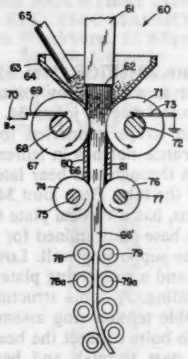
3,608,182
METHOD OF FORMING ELECTRIC CABLE SHEATHS
Kenneth Edward Lawrence Hughes, Romsey, and James Arthur Francis Donelan, Alton, England, assignors to Pirelli General Cable Works Limited
Filed Apr. 11, 1969, Ser. No. 815,383
Claims priority, application Great Britain, Apr. 17, 1968, 18,084/68
Int. Cl. B23k *1/20, 31/02*
U.S. Cl. 29—482 **5 Claims**

A method of forming a radially extending annular flange on a corrugated metal sheath of an electric cable comprises applying axially opposed compressive forces to the opposite side walls of a single corrugation crest of the corrugated sheath, thereby compressing the crest until the opposite side walls contact each other. The single corrugation crest is spaced from the ends of the sheath and lies between adjacent corrugation crests and any tendency of the sheath to shorten as a result of the compression step is balanced by a flattening of the adjacent corrugation crests, which may itself occur during the compression step or be purposefully effected in a pre-compression swaging step. The flange which results from the compression step provides a highly convenient land



to which a component, such as a joint end bell, may be welded, the end bell firstly being positioned with an annular flange thereon in abutment with the compressed corrugation crest.

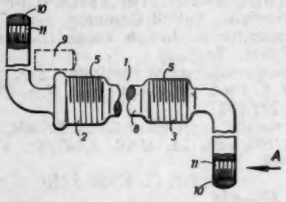
3,608,183
METHOD OF FABRICATING A REINFORCED MATERIAL
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Continuation-in-part of application Ser. No. 573,148, July 26, 1966, now Patent No. 3,437,783, which is a continuation-in-part of application Ser. No. 239,034, Nov. 20, 1962. This application Mar. 27, 1969, Ser. No. 814,885
Int. Cl. B23k *19/00*
U.S. Cl. 29—527.7 **10 Claims**



A method for producing a composite material and the improved material structure which is composed of a matrix and a plurality of reinforcing elements which are combined within said matrix to form a unitary structure therewith. The reinforcing elements may comprise metal wires, filaments or whiskers disposed within a ceramic matrix or substrate wherein the filaments serve to reinforce the matrix material.

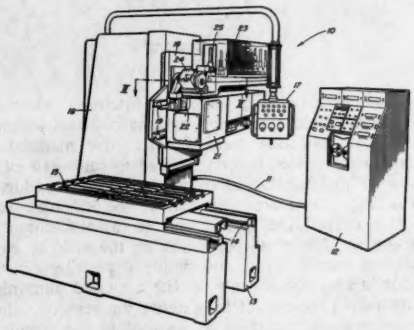
The process involves continuously feeding a plurality of filaments and matrix material to a die and thereafter predeterminately forming a continuous shape thereof. In one form, the filaments or whiskers are continuously formed as they are fed to the die or mold employed to form the composite material; the filaments may also be fabricated of glass, ceramic, polymers or carbonized material which may be randomly or evenly dispersed within the matrix material.

3,608,184
CRANK FORMING METHOD
Alfred Thun, Ennepetal-Vorde, Germany, assignor to Alfred Thun & Co. G.m.b.H., Ennepetal-Altenvoerde, Germany
Filed Mar. 18, 1969, Ser. No. 808,151
Claims priority, application Germany, Mar. 21, 1969, P 17 52 015.9
Int. Cl. B23p 13/04
U.S. Cl. 29—557 7 Claims



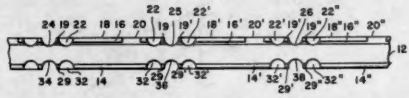
A method for making a bicycle tread crank from a rod includes the steps of forming a collar in the center of an elongated rod, subsequently forming threads on the collar, and subsequently bending the free ends of the rod in directions opposite to each other to form cranks.

3,608,185
MACHINE TOOL
Stanley A. Pfister, Wilmington, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Apr. 10, 1969, Ser. No. 815,049
Int. Cl. B23q 3/157
U.S. Cl. 29—568 8 Claims



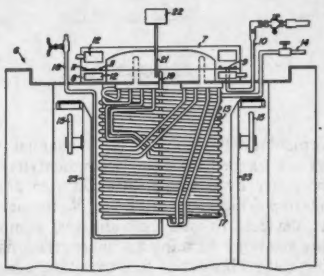
This invention relates to a machine tool and, more particularly, to a numerically-controlled machining apparatus having tool-changing capability.

3,608,186
SEMICONDUCTOR DEVICE MANUFACTURE WITH JUNCTION PASSIVATION
Jearld L. Hutson, P.O. Box 34235, Dallas, Tex. 75234
Filed Oct. 30, 1969, Ser. No. 872,645
Int. Cl. B01j 17/00; H01l 7/66
U.S. Cl. 29—583 8 Claims



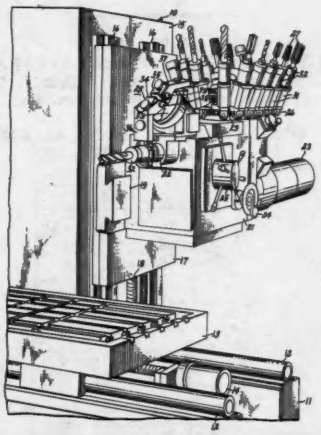
Junction passivated semiconductor devices and a method of manufacturing same in which a rectifying junction is formed in a semiconductor body, a plurality of spaced apart, continuous grooves are cut in a surface of the body that extend through the rectifying junction to form a plurality of devices each having a separate junction in which the plurality of separate junctions intersect the plurality of continuous grooves, respectively, along the entire length thereof, another groove is cut in the same surface of the body between adjacent ones of the plurality of grooves, the plurality of separate junctions are passivated at the surfaces of the plurality of grooves, and the plurality of devices are separated from the body along said another groove.

3,608,187
VACUUM BRAZING-GAS QUENCHING NON-FERROUS AND FERROUS ALLOYS
Paul K. Shutt, Jr., Aberdeen, Francis B. Gurtner, Baltimore, and Frank T. Kirk, Jr., Forest Hill, Md., assignors to the United States of America as represented by the Secretary of the Army
Filed Apr. 16, 1969, Ser. No. 816,697
Int. Cl. B23k 31/02
U.S. Cl. 29—487 2 Claims



The disclosure relates to the apparatus and method for joining metal parts together through the utilization of a vacuum brazing-gas quenching technique.

3,608,188
MACHINE TOOL
William B. Seidel, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio
Filed Jan. 22, 1969, Ser. No. 792,925
Int. Cl. B23q 3/157
U.S. Cl. 29—568 12 Claims



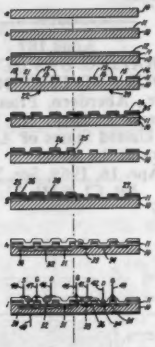
This invention has to do with a machine tool and, more particularly, a machine tool having a tool changing capability, wherein an interchanger is provided for transferring a tool from a tool rack to a work spindle and wherein the tool located in the tool rack for transfer is at a right angle to the axis of the spindle.

3,608,189

METHOD OF MAKING COMPLEMENTARY FIELD-EFFECT TRANSISTORS BY SINGLE STEP DIFFUSION

Peter V. Gray, Scotia, N.Y., assignor to General Electric Company

Filed Jan. 7, 1970, Ser. No. 1,110
Int. Cl. B01j 17/00; H01g 13/00
U.S. Cl. 29—571 10 Claims



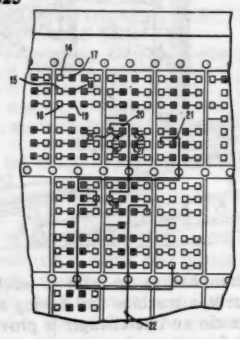
Complementary N-channel and P-channel field-effect transistors are formed on a single conductivity-type semiconductor wafer by a single diffusion step and a single patterning step which separates the N-channel from the P-channel devices. In one embodiment, complementary devices are made by forming an appropriate pattern in a conducting and an insulating film overlying a semiconductor wafer of a first conductivity type, depositing an opposite conductivity type inducing impurity-doped insulating film over the patterned wafer, depositing a first conductivity type inducing impurity-doped insulating film over the first film, removing the impurity-doped films from one portion of the wafer, depositing an opposite conductivity type inducing impurity-doped insulating film over the entire wafer, diffusing the impurities into the wafer to form source and drain regions for one transistor and source, drain and a channel region for the complementary transistor and forming electrical contacts to the source, drain and gate regions of both devices.

3,608,190

ROUTING PINS FOR WIRING APPARATUS

James J. Steranko, Weston, and Arthur J. Guidi, Jr., Medway, Mass., assignors to Inforex, Inc., Waltham, Mass.

Filed June 13, 1969, Ser. No. 833,084
Int. Cl. B41m 3/08; B23k 1/00
U.S. Cl. 29—625 4 Claims



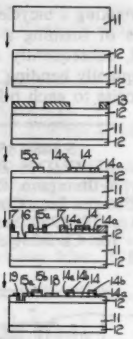
In the wiring of an electrical circuit on a circuit board having solder pads suitable for connection to circuit components, insulated wire passes through a solder head which is moved relative to the position of the board. A fixture has routing pins which protrude through holes in the circuit board so that the solder head can only move between rows of the routing pins. This prevents unintentionally bonding a wire to a pad.

3,608,191

SEMICONDUCTOR ARRANGEMENTS

Victor Needham, Balsall Common, near Coventry, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Continuation-in-part of application Ser. No. 750,204, Aug. 5, 1968. This application Feb. 17, 1969, Ser. No. 799,892
Claims priority, application Great Britain, Aug. 3, 1967, 35,748/67; Feb. 21, 1968, 8,347/68; Feb. 27, 1968, 9,391/68
Int. Cl. H05k 3/30
U.S. Cl. 29—626 9 Claims



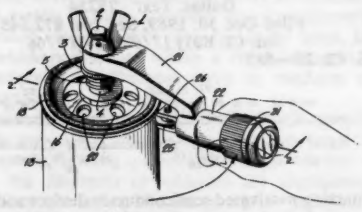
A semiconductor arrangement is disclosed which includes an anodised aluminium backing plate on which is deposited at least one area of conductive material. A semiconductor device is then secured to said area either directly or through the intermediary of the conductor. Alternatively, the aluminium can be the substrate of a thin film circuit, the circuit can be manufactured by anodising an aluminium plate, heating the plate to stress relieve the anodic layer, and finally depositing resistive and conductive components on the anodised aluminium and annealing the circuit to stabilise the resistor values. The components can then be secured to the circuit as necessary.

3,608,192

VARIABLE RADIUS ROTARY DISK CUTTER

William B. Hansel, Media, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

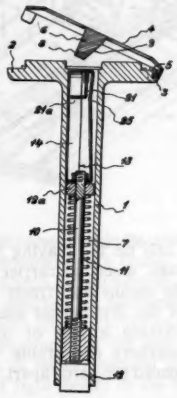
Filed Nov. 14, 1969, Ser. No. 876,678
Int. Cl. B67b 7/30
U.S. Cl. 30—11 5 Claims



A tool for opening filters of the sealed "spin-on" type comprises a spindle carrying two sets of threads of different sizes adapted to mate respectively with threads pro-

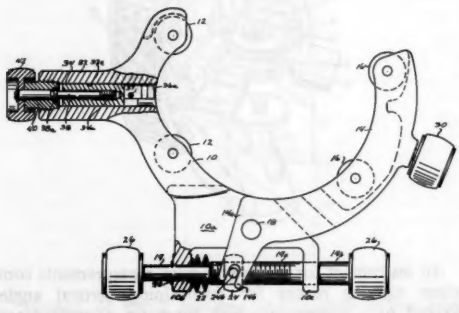
vided in the bottom plates of two unlike filters, and a radially-extending arm mounted for rotation about the spindle axis. The arm carries at its outer end a cutting wheel which can be manually moved toward or away from the spindle axis.

3,608,193
RAZOR WITH AUTOMATIC CLAMPING MECHANISM
Jose Bassat Jerusalmi, Barcelona, Spain, assignor to Bassat S.A., Barcelona, Spain
Filed May 2, 1969, Ser. No. 821,213
Claims priority, application Spain, May 2, 1968, 138,923
Int. Cl. B26b *21/14*
U.S. Cl. 30—58 **14 Claims**



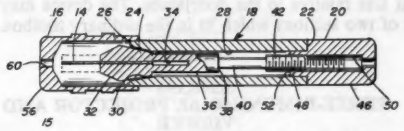
This disclosure provides a razor having an automatic clamping mechanism for attaching a top member to a body member. This clamping mechanism comprises an assembly which includes a downwardly extending projection fixedly mounted to the bottom of the top member. The downwardly extending projection has a widened latching portion at the bottom thereof. Means are located within a longitudinal recess of the body member to clamp the widened latching portion when the downwardly extending projection is urged into the top end of the longitudinal recess.

3,608,194
PLASTIC PIPE CUTTER
Floyd Y. Miller, Elyria, Ohio, assignor to Emerson Electric Co., St. Louis, Mo.
Filed Jan. 28, 1969, Ser. No. 794,614
Int. Cl. B23d *21/08, 21/10*
U.S. Cl. 30—94 **1 Claim**



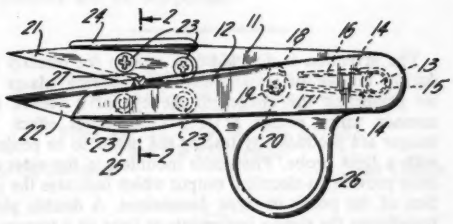
A pair of arcuate cutter frames which carry rollers for engagement with the periphery of a pipe are hingedly connected to each other. Screw and spring means is connected to the frames adjacent the hinge to swing the two frames toward each other and into engagement with the pipe to be cut. One of the frames has a guide in which a holder that carries a cutter bit or blade is slidably mounted. Screw means is provided to adjust the cutter bit or wheel into engagement with the pipe. The pipe is cut by rotating the tool around the pipe and advancing the cutter bit or blade into the pipe.

3,608,195
KNIFE WITH REMOVABLE BLADE
Ralph Levin, 402 Knickerbocker Ave., Brooklyn, N.Y. 11237
Filed Mar. 19, 1969, Ser. No. 808,610
Int. Cl. B26b *29/02*
U.S. Cl. 30—162 **5 Claims**



A knife comprising a blade-retaining member a blade removably mounted in said retaining member and a cap provided to exposably shield said blade removably mounted in said retaining member.

3,608,196
THREAD CLIP OR SNIP
Richard R. Wiss, Short Hills, N.J., assignor to J. Wiss & Sons Co., Essex, N.J.
Filed July 17, 1969, Ser. No. 842,465
Int. Cl. B26b *13/04*
U.S. Cl. 30—253 **3 Claims**

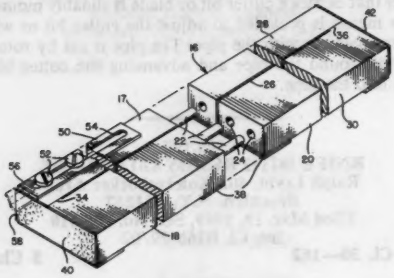


A thread clip or snip consisting of handle members made of plastic with inserted cutting blades. The handle members have finger rests or pads above or adjacent the blades and have a torsion spring inserted around the pivot for opening of blades. A plastic stop on one of the handle members is provided for limiting the closing stroke of, or regulating the point opening between the blades.

3,608,197
CARPET KNIFE AND GUIDE
David Lloyd McIvor, 5812 Appoline, Dearborn, Mich. 48126, and Richard Alvin Robinson, 15489 Lexington, Redford, Mich. 48239
Filed July 17, 1968, Ser. No. 745,513
Int. Cl. B26b *3/08*
U.S. Cl. 30—294 **4 Claims**

A device for guiding the cutting of two carpets requiring a seam at a doorway between two rooms. An

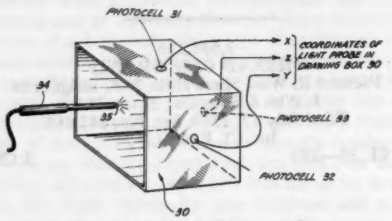
adjustable carpet knife slides in a slot in the device to cut each carpet to a predetermined depth and along an identical line relative to the doorjambs. The device may consist of two sections which fit in the ordinary toolbox.



3,608,198
THREE-DIMENSIONAL PROJECTOR AND VIEWER

Russell W. Ludwick III and Robert E. Ludwick, both of 1401 Vista Del Mar, Fullerton, Calif. 92631

Filed July 28, 1969, Ser. No. 845,255
Int. Cl. B43l *13/00*
U.S. Cl. 33—1M **3 Claims**



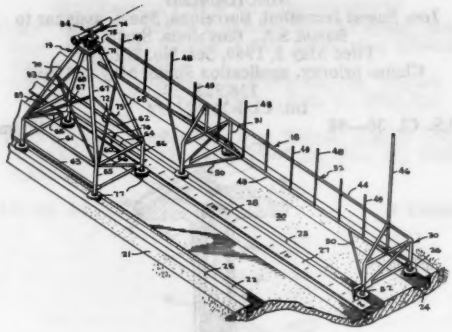
The invention is directed to a system for directly producing images on two transparent viewing plates and for projecting the images to the eye of a viewer in a manner which causes a three dimensional effect. The images are produced by tracing the image to be projected with a light probe. Photocells mounted in the sides of a cube provide an electrical output which indicates the position of the probe in three dimensions. A double plotter transforms the signals into points or lines on a transparent recording medium. For re-creating the initial three dimensional image for viewing, the two substantially identical images are focussed onto a viewing lens by means of two parallel focussing lenses. Each focussing lens receive only one of the recorded images which it directs and superimposes on the viewing lens. The eyes of the viewer see the two superimposed images and combine them to form a composite image having depth.

3,608,199
LOCATING AND MEASURING DEVICE FOR A FOOTBALL PLAYING FIELD

John C. Hunt, 1306 Holcomb, San Angelo, Tex. 76901

Filed Dec. 4, 1969, Ser. No. 881,995
Int. Cl. G01c *15/12*
U.S. Cl. 33—46F **10 Claims**

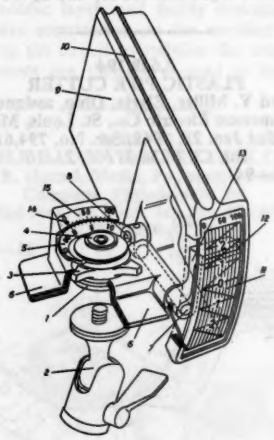
A locating and measuring device adapted for use with a football playing field generally including a pair of guide means disposed parallel to a side line of the playing field, a yardage scale disposed parallel and between the guide means, a first carrier member mounted on one of the guide means and freely movable therealong, a sighting device mounted on such carrier means, having a sighting axis disposed in a vertical plane disposed perpendicular to the guide means, a pointer disposed on the carrier means having a marker cooperable with the scale for indicating the location of the ball on the playing field viewed through the sighting means, a second carrier means mounted on the second guide means and freely movable therealong independently of the first carrier means, and the second carrier means having a pair of longitudinally spaced pointers with markers cooperable with the scale, the markers being spaced ten yards apart.



3,608,200
INSTRUMENTS FOR MAKING ANGULAR MEASUREMENTS

Gunther W. H. Knochenhauer, Stockholm, and John Bernhard Wenell, Stocksund, Sweden, assignors to System Paulin AB, Stockholm, Sweden

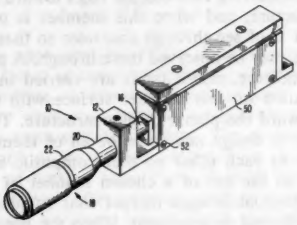
Filed Mar. 3, 1969, Ser. No. 803,647
Int. Cl. G01c *1/00*
U.S. Cl. 33—69 **5 Claims**



An instrument for making angular measurements comprises sighting means for determining vertical angles pivoted to a mounting which turns on a vertical axis having a graduation for determining horizontal angles. The sighting means is associated with a box-shaped pro-

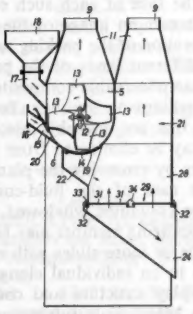
tective casing which can be rotated about an axis parallel to the vertical plane through the line of sight so as to serve as a protection for the graduated scales, indexes and bearing means. Besides, the end wall of the casing facing the observer is provided with a graduated scale for vertical angles.

3,608,201
RIGHT ANGLE MICROMETER
Otto R. Butsch, New Albany, Ohio, assignor to Reliance Electric Company, Columbus, Ohio
Filed Mar. 19, 1969, Ser. No. 808,395
Int. Cl. G01b 5/14
U.S. Cl. 33—162 7 Claims



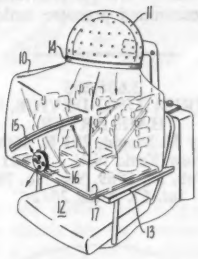
Disclosed is a micrometer spindle and a bar mounted for reciprocating movement on a frame. A pair of blocks are carried by the frame for movement in a direction at right angles to the direction of movement of the spindle and bar. Cam surfaces on the blocks and bar engage one another whereby movement of the bar in one direction by threading action of the micrometer spindle moves the blocks outwardly at right angles to the spindle. A spring biases the blocks for inward movement in following engagement with the cam surfaces carried by the bar. A measuring plate connects between the blocks and indicia carried by the micrometer spindle and thimble measure the displacement of the plate at right angles to the axis of the spindle.

3,608,202
DEVICE FOR BATCH ROASTING AND COOLING PARTICULATE MATERIAL
Hans Ulrich Arndt and Peter Rossi, Mulheim (Ruhr), Germany, assignors to Maschinenfabrik Ferd. Gothot G.m.b.H., Mulheim (Ruhr), Germany
Filed Mar. 7, 1969, Ser. No. 805,252
Claims priority, application Germany, Mar. 7, 1968, P 17 29 425.6
Int. Cl. F26b 11/12, 19/00
U.S. Cl. 34—66 16 Claims



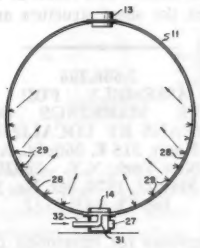
Method of batch roasting and cooling coffee, cocoa beans, peanuts and like particulate material, wherein the material being roasted is exposed to a hot and a cool air flow, includes mechanically and pneumatically raising the roasting material from the bottom of a stationary roasting chamber and revolving it, exposing the revolving roasting material to a gas flow travelling in the same direction as the revolving roasting material, and then passing the roasting material into a cooling chamber; and device for carrying out the method.

3,608,203
WIG DRYING APPARATUS
Leon F. Willat, 12 Sky Road, Mill Valley, Calif. 94941
Filed Dec. 11, 1969, Ser. No. 884,161
Int. Cl. F26b 19/00
U.S. Cl. 34—91 6 Claims



An attachment for hair driers having a semi-spherical drying hood. Apparatus to be used with a conventional hair drier for drying one or several wigs at the same time comprising a flexible, transparent enclosure having an opening for receiving the hood of a hair drier, means for securing the opening of said enclosure about the hood of a hair drier without allowing substantial air leakage, a rigid platform disposed within the transparent enclosure, and a valve mounted in a wall of the enclosure, said valve being adjustable to control the rate of drying while maintaining a back pressure sufficient to support the enclosure in an inflated condition under various conditions of pressure and air temperature.

3,608,204
VESSEL FOR STORING GRAIN
Robert Barry Ashby, 8925 Falling Creek Court, Annandale, Va. 22003
Filed Apr. 23, 1969, Ser. No. 827,452
Int. Cl. F23b 19/00
U.S. Cl. 34—218 13 Claims



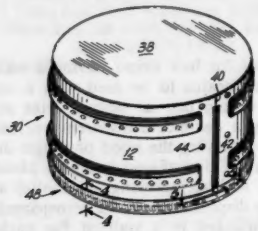
A method of storing grain comprising the steps of placing harvested grain directly in a storage vessel; passing drying air throughout said mass of grain in said vessel to remove moisture therefrom; passing a fumigant throughout said mass of grain stored in said vessel; and sealing said vessel with said grain therein.

The storage vessel is spheroid in shape and fabricated on site. The vessel is formed of vertically extending

meridianal ribs to which is attached a wire mesh. The ribs and wire mesh are encased in an inner core of a sprayed elastomeric coating of urethane or similar foam. An interior and exterior coating of an epoxy resin is applied to the inner foam core to provide a sealed vessel. A sealed grain loading port is provided at the top while a discharge port and gas intake opening is formed in the base. The entire vessel is rigidly mounted on its vertical axis on a supporting base.

The exterior epoxy coating may include suitable coloring pigmentations for heat reflection as well as fungicides and pesticides to completely protect the stored grain. Means are provided for dispersing air into the base and throughout the vessel to accelerate drying and fumigation. A safety port may be mounted in the top or sidewalls for removing test specimens and for providing pressure plugs to relieve any determined pressure build up within the vessel.

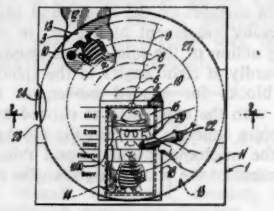
3,608,205
FLUID-DISTRIBUTING DEVICE, SUCH AS A HAIR DRYER
Sidney H. Magid, 201 E. 66th St., New York, N.Y. 10021
Filed Feb. 14, 1969, Ser. No. 799,433
Int. Cl. A45d *20/24*
U.S. Cl. 34—99 **9 Claims**



A device, which is adapted to direct a fluid to a given space. The device includes a flexible sheet structure to one side of which a given fluid is to be directed. A manifold is situated next to the sheet structure, for receiving the fluid before the latter reaches the given space. Communication is provided between the interior of the manifold and the given space, so that fluid will flow from the interior of the manifold to the latter space. When the device is a hair dryer, the sheet structure will define a bonnet adapted to receive a body of hair in its interior, and the manifold will receive hot air to be directed to the interior of the bonnet as a result of a communication provided between the sheet structure and the manifold.

3,608,206
EXHIBITOR ASSEMBLY FOR IMPRINTING OBSERVABLE MARKINGS ON DISPLAY PLANAR MEANS BY LOCALIZED PRESSURE
Philip H. Knott, 315 E. 86th St., Apt. 2N E., New York, N.Y. 10028
Filed May 21, 1970, Ser. No. 39,236
Int. Cl. B43l *1/12*
U.S. Cl. 35—26 **12 Claims**

Exhibitor assemblies for imprinting observable markings of a decorative, informative or amusing nature. Rigid carrier structure supports all of the elements of each assembly, which may be portable. In each a depressible, flexible, planar display means, either in the form of a sheet or a flat envelope loaded with a layer of viscous liquid or paste, is supported laterally in a temporarily guided position for observation of its outer face. This planar display structure is of a distinctive coloration and removable from its lateral guided position to effect removal from the assembly of observable markings that are developed on its outer face by operation of the assembly. The planar display structure has either a temporary or permanent opacity which will hide to an effective degree at a reasonable distance of observation any underlying surface or element. Planar backing means has a surface of contrastingly different coloration underlying and substantially hidden by the planar display structure with a minute space normally intervening them. For example, the planar display structure is of a seeming white hue and the underlying backing surface is black. The carrier structure movably supports a pressure-localizing member, which may be located below the backing means or outward of the planar display structure, but in both cases a lands-bearing face thereof faces toward the planar display structure, and when this member is outward of the latter it is of see through character so that the outer display face may be observed therethrough. A plurality of pressure-localizing, raised lands are carried in relatively spaced relation on this member surface with their faces directed toward the planar display structure. These lands faces differ in design and some or all of them are complementary to each other so that composite images developed from the use of a chosen number of them will include individual images thereof that supplement each other in a desired arrangement. When the pressure-localizing member is located below the backing surface it underlies the backing means and the latter is a flexible web so that pressure applied by any suitable means, such

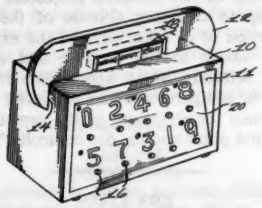


as a rubbing instrument or ram, to a localized portion of the outer face of the planar display structure will flex the latter and the web together over the face of any one of the pressure-localizing lands that underlies the web in alignment with the locality of the applied pressure. When the pressure-localizing land is located outward of the planar display structure any land thereof is used as the means of applying the pressure to the outer face of the former, to flex the planar display structure locally against the backing surface that is held firmly. In either case the planar display structure may become windowed in the shape of the face of each such employed land to develop on the former an image of the latter in a color matching the coloration of the backing surface. Successive operations with different lands of the pressure-localizing member develop an observable composite image of a plurality of such markings on the outer face of the planar display structure that are desirably associated with each other, and this may be eliminated from the assembly for reuse of the latter by removing the planar display structure and, in the case of the fluid-contained envelope smoothing out the contained windowed viscous fluid.

The pressure-localizing member may be a lands-bearing rotary disk, or one or more slides with each of the latter slidably mounted in an individual elongated channel.

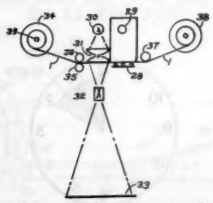
The planar display structure and contrasting backing surface may be a Magic Slate sub-assembly of either the temporary adhering sheet form or the mobile paste envelope form that are both described in line 19 of column 1 to line 34 of column 2 of the Knott U.S. Pat. No. 3,279,100 of Oct. 18, 1966.

3,608,207
TEACHING APPARATUS
James D. Bissell, Rte. 1, Pfafftown, N.C. 27040
Filed July 8, 1969, Ser. No. 839,867
Int. Cl. G09b 7/02
U.S. Cl. 35—9R 13 Claims



Teaching apparatus for taking advantage of the psychological factor of reward in teaching so as to make the learning process a pleasant game playing experience wherein the apparatus includes an instructor's position and one or more student positions. The instructor's position and each of the student positions are provided with a plurality of buttons over which identical overlays may be placed wherein the overlays contain a plurality of colors, shapes, numbers, letters, words etc. which represent answers to questions. The apparatus is provided with ready-right/wrong circuitry so that the instructor initially asks the students a question and presses the appropriate button on his panel to indicate the correct answer. When this occurs the ready light is lighted at each of the student positions and the students then press the button which they believe corresponds to the correct answer to the question. If the correct button is pushed the "right" light will be lighted at the student console and if the wrong answer is selected the wrong light will be lighted.

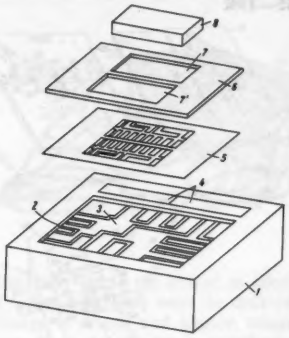
3,608,208
TEACHING MACHINE
Fred W. Willardson, R.D. 8, Lexington, Ohio 44904
Filed June 18, 1969, Ser. No. 834,382
Int. Cl. G09b 5/02
U.S. Cl. 35—9R 6 Claims



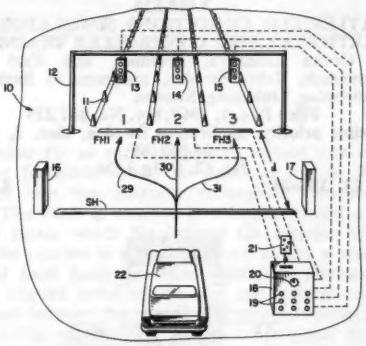
A teaching machine having improved means to move a film from a first viewing position to one of a plurality of possible second viewing positions wherein the means to move the film includes means, dependent on an operator's response while in the first viewing position, to stop the film in a second viewing position corresponding to said response.

3,608,209
EDUCATIONAL GAME
Udo Schnelle, Frankfurt am Main, Germany, assignor to Franckh'sche Verlagshandlung W. Keller & Co., Stuttgart, Germany
Filed Oct. 14, 1969, Ser. No. 866,193
Claims priority, application Germany, Oct. 15, 1968, G 68 02 334
Int. Cl. G09b 7/00
U.S. Cl. 35—9D 35 Claims

An educational game composed of a plurality of teaching elements, preferably in the form of building blocks with symbols on one surface and conductors on the opposite surface, insertable into a defined area of a frame in a box containing a circuit card and a circuit board in electrical contact with each other. The circuit board is fixed in the box, but the circuit card can be replaced with a different one. Lamps are provided to indicate whether the blocks are properly arranged. A relay causes the circuit for the correct signal lamp to open if there is a current in the circuit for the error signal lamp. A relay can also be provided to open the correct signal lamp circuit unless the error signal lamp has been actuated at some time since the previous correct answer.

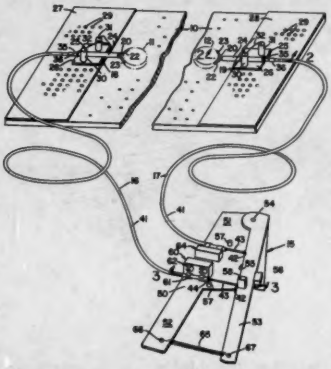


3,608,210
TRAFFIC HAZARD SIMULATOR
Paul Henry O'Shea, Newport Beach, Calif., assignor to California Automotive Research
Filed Oct. 23, 1969, Ser. No. 868,739
Int. Cl. G09b 9/04
U.S. Cl. 35—11 10 Claims



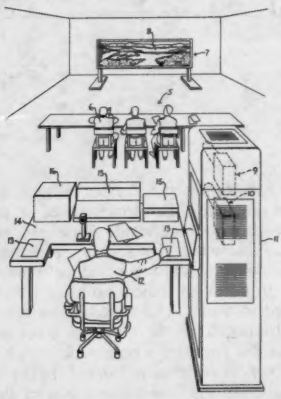
A system for testing the driving ability of an automobile driver includes the provision of a plurality of traffic lanes with associated traffic signal red, orange, and green lights. Preselected lights may be programmed to operate in response to closing of an actuating switch so that there is provided an indication as to which lanes are open or closed to traffic. The actuating switch is disposed at a given distance from the entrance areas of the lanes and may take the form of a hose type switch so that an approaching car energizes the signal lights when at a given distance from the lanes. The driver of the car must then make a decision as to which lane is open, if any, within the time period determined by his speed and the said given distance.

3,608,211
LAUNCHING DEVICE
Herman Y. Carr, Somerville, N.J., assignor to Paul A. Stokstad, doing business as Pasco Scientific, San Leandro, Calif.
Filed Feb. 2, 1970, Ser. No. 7,637
Int. Cl. G09b *23/08*
U.S. Cl. 35—19R **10 Claims**



A launching device for demonstrating collision principles. Each of a plurality of pushers has a direction-controlling tube and a firing rod slidable inside said tube, with a direction-controlling bumper on its outer end. Each pusher has a corresponding cable having a stationary outer flexible tube and a flexible rod slidable inside engaging the firing rod at one end and a plunger extending beyond the other end of said tube. An initiator has a stationary member to which the plunger ends of all the flexible tubes are secured and a trigger lever pivoted to the stationary member and engaging the plungers, the distances of the plungers from the pivot relative to each other determining the relative launching speeds.

3,608,212
BATTLEFIELD CONDITIONS SIMULATOR FOR ARTILLERY FIRE CONTROLLER TRAINEES
Erik Goran Lenneryd, Bromma, and Karl Reidar Trumstedt, Taby, Sweden, assignors to Saab-Scania Aktiebolag, Linkoping, Sweden
Filed Dec. 1, 1969, Ser. No. 881,219
Claims priority, application Sweden, Dec. 3, 1968, 16,367/68
Int. Cl. F41g *3/26*
U.S. Cl. 35—25 **6 Claims**

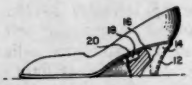


On a battlefield panorama, images of artillery projectile explosions are projected at the locations they would attain if fired from a gun laid according to fire controller's orders, and of appearance that takes account of any intervening elevations in the depicted terrain. Location of each explosion is computed by comparing terrain elevation signals from a three-dimensional memory unit, taken along the track of the assumed projectile, with a signal corresponding to changing altitude of the projectile in the final portion of its trajector; and the explosion image projector is swung to the location and elevation thus determined. Selection of an appropriate image is made in response to comparison of an explosion elevation signal with signals for elevations of the depicted terrain between the burst point and the fire controller's post.

ERRATUM

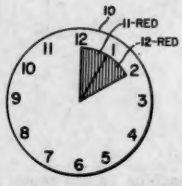
For Class 35—39 see:
Patent No. 3,608,214

3,608,213
CONVERSION HEEL
Ivan Amdi Jensen, 12 Wilk Drive, Fords, N.J. 08863
Filed Jan. 30, 1970, Ser. No. 7,051
Int. Cl. A43b *21/00*
U.S. Cl. 36—34R **5 Claims**



A conversion heel device which permits heeled shoes to be transformed into flat wedge heel shoes including a chamber to accommodate the high heel of the shoe being converted and a means to fasten the heel in place.

3,608,214
TEACHING AID AND METHOD
Patricia M. Rancati, 3304 Rumson Road, Cleveland Heights, Ohio 44118
Filed July 11, 1969, Ser. No. 840,965
Int. Cl. G09b *19/12*
U.S. Cl. 35—39 **5 Claims**



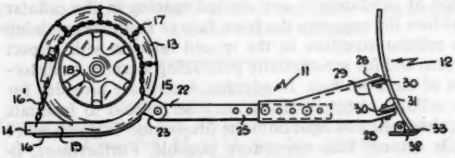
This invention relates to a device and method for teaching the reading of time. It includes a disc having indicia circumferentially spaced about the periphery of one face to designate increments of time. The indicia differ from each other by shape and in a selected manner other than shape and such that the differences can be independently sensed by the human senses of sight and touch. There is also provided a plurality of sets of indicators each shaped as a sector of the disc face with each set differing from the other sets in the same manner as the indicia differ from each other, whereby the sets of indicators each relate to a different indicia on the disc face respectively. Initially, the passage of time is indicated by successively applying the sector indicators of a selected set to the clock face between successive indicia; the sector set corresponding to a selected one of the indicia for identification by at least one feature selected from the group

consisting of color and texture. Thereafter, the sectored indicator sets are replaced by corresponding sets of pairs of linear indicators, viz, corresponding to the same color and/or texture of the sectorial indicators and selected indicia; the pair of a selected set being selectively positioned about the disc face to indicate the passage of time. Finally, the disc is replaced by a disc having indicia that do not differ from each other in the selected manner and a pair of linear indicators are selectively positioned about the face of the disc to indicate the passage of time; the latter arrangement corresponding to a standard clock face.

3,608,215
FOOTWEAR
Tatsuo Fukuoka, 3, 3-Ban, 2-chome, Shin-Minami-Fukushima, Tokushima, Japan
Filed Sept. 16, 1969, Ser. No. 858,389
Claims priority, application Japan, June 14, 1969, 44/56,298, 44/56,299, 44/56,300, 44/56,301, 44/56,302
Int. Cl. A43b *13/20*
U.S. Cl. 36—29 **8 Claims**

A hollow main body is provided for use as a wedge type sandal or as a sole or insole of a shoe. The main body is integrally formed of plastic and is provided with a hollow internal chamber surrounded by an upper wall, side walls and a lower wall. The upper wall is preferably thinner than the side walls and lower wall, and the hollow chamber provides a comfortable cushion effect to the wearer. The main body may be formed by blow molding, splash molding, or the like.

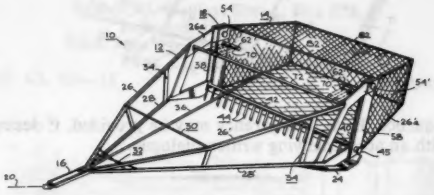
3,608,216
SNOW PLOW ATTACHMENT FOR REAR WHEEL DRIVE VEHICLES
Clovis H. Prescott, Box 4–322, R.R. 3, Winnipeg, Manitoba, Canada
Continuation-in-part of applications Ser. No. 766,733, Oct. 11, 1968, and Ser. No. 877,113, Nov. 17, 1969. This application Mar. 20, 1970, Ser. No. 21,408
Int. Cl. E01h *5/06*
U.S. Cl. 37—42R **10 Claims**



A snow plow attachment for vehicles and comprises a plowing blade held on a pair of side beams which are adjustable in length to varying inclination of the blade. The beams are in turn secured by horizontal pivots to pans or trays upon which the front wheels of the vehicle engage and chains hold the trays to the wheels so that when the wheels are turned, the snow plow also turns.

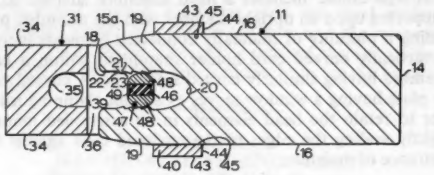
3,608,217
OYSTER DREDGING SYSTEM
Charles J. Voisin, Sr., Star Route, Box 200, Theriot, La. 70397
Filed Feb. 28, 1969, Ser. No. 803,345
Int. Cl. E02f *5/00*
U.S. Cl. 37—55 **10 Claims**

An improved oyster dredging arrangement comprising an oyster dredge and an oyster dredge dumping and launching structure. The oyster dredge is dragged along the ocean bottom and oysters are scooped into a basket portion thereof. When the basket is full the oyster dredge is pulled over the oyster dredge dumping structure and cooperative means are provided on the dumping structure and the basket so that continued pulling up of the oyster



dredge automatically opens the basket to allow the contents thereof to fall by gravity onto the deck of the boat. When the dredge is empty and tension relaxed on the hoisting means the oyster dredge is launched overboard by the oyster dredge dumping and launching structure so the process may be repeated.

3,608,218
SNAP-TYPE RESILIENT RETAINER FOR EXCAVATING TEETH
Walter L. Sturgeon, Los Altos, Calif., assignor to Pengo Corporation, Sunnyvale, Calif.
Filed Mar. 24, 1969, Ser. No. 809,702
Int. Cl. E02f *9/28*
U.S. Cl. 37—142A **4 Claims**

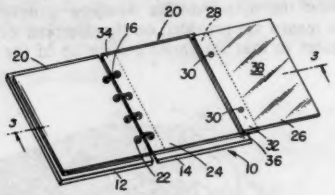


A retainer for an excavating tooth formed with a slot extending forwardly from the proximal end to divide the tooth into two generally rectangular cross-section prongs. The tooth is received in a holder having a rectangular recess which fits around the exterior of the tooth. The retainer is a three-part pin having a resilient core and hard faces on either side. The retainer fits through aligned holes in the top and bottom of the holder and between the prongs. Buttress-type projections on the facing edges of the prongs are engaged by the retainer to prevent withdrawal of the tooth while the retainer is in position. The shape of the projections permits the tooth to be driven into place while the retainer is in place in the holder.

3,608,219
BOOK FOR HOLDING TRANSPARENCIES FOR VIEWING AND STORAGE
Max Verebay, Jamaica, N.Y., assignor to Visionetics, Inc., Long Island City, N.Y.
Filed May 19, 1969, Ser. No. 825,831
Int. Cl. G09f *11/06*
U.S. Cl. 40—102 **4 Claims**

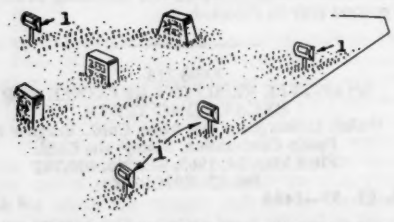
Means for holding transparencies for viewing and storage comprising a book interleaved in a manner such that

said transparencies may be selectively viewed either individually or simultaneously in any number in any desired



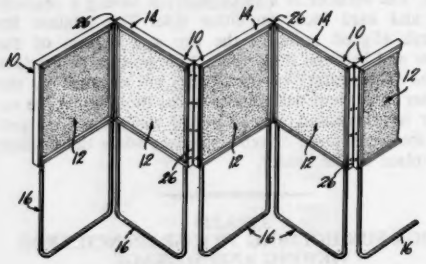
sequence. Each transparency may be provided, if desired, with an accompanying written dialogue.

3,608,220
GRAVE MARKER
James W. Fryrear, Nevada, Mo., assignor to The W. F. Norman Sheet Metal Mfg. Co., Nevada, Mo.
Filed June 15, 1970, Ser. No. 45,960
Int. Cl. G09f *1/00*
U.S. Cl. 40—125H **13 Claims**



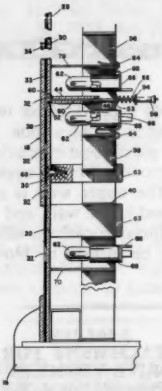
A sign holder includes a head assembly adapted to be supported upon an upright member with the assembly providing a plurality of manually connected elements includ- a vertically curved card holder snap-fitted within a base member having similarly curved side walls. A curved cover plate having a window serves as a front clamping member to retain the head elements in an assembled manner tightly sealing the edges of the enclosed card against the entrance of moisture.

3,608,221
DISPLAY PANEL
William J. Harris, Alpine, N.J., assignor to Museum Planning, Inc., New York, N.Y.
Filed Dec. 8, 1969, Ser. No. 882,977
Int. Cl. G09f *7/00*
U.S. Cl. 40—125H **7 Claims**



A free-standing, collapsible display structure, comprises a plurality of panel units, each of which includes a panel board element carried in a peripheral supporting frame composed of lengths of extrusions formed with a longitudinal channel for carrying end portions of the panel units and for slidably receiving supporting legs. Flanges extending from the supporting frame form a groove for retaining display materials on the surfaces of the panel board elements. The several panel units are hinged together in an accordion-like fashion, permitting the structure to be collapsed so that the several units are in surface-to-surface relation but permitting the structure to be extended into a free-standing configuration in which the units are at an appropriate angular relation to each other. Hinge fasteners are received in longitudinal cavities formed in the frame members.

3,608,222
BACK LIGHTED PANEL
John H. Koch, P.O. Box 11, Williamsville, N.Y. 14221
Filed Oct. 22, 1968, Ser. No. 769,694
Int. Cl. G09f *13/06*
U.S. Cl. 40—130E **3 Claims**

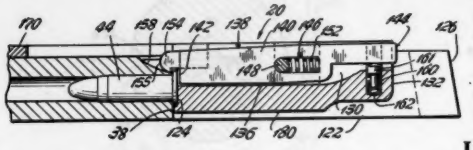


A back lighted panel having a cellular or "egg crate" structure supported on and spaced from a front translucent display panel or face in a manner substantially precluding shadows or other interruptions in the illustrative matter applied to or provided on the front display face. Removable support members are provided which may be disposed at substantially any desired spacing in the cellular structure for engaging the front face to facilitate retaining the cellular structure in the spaced relation with respect thereto and for substantially precluding warping or distortion of the front face. In addition, inserts are provided for the cellular structure which may be utilized to facilitate the channeling of light onto the illustration face in a more facile manner than heretofore possible. Furthermore, illustration inserts are provided which may in and of themselves be utilized in combination with the cellular structure and the translucent face for building or constructing a lighted illustrative system on the said illustration face.

3,608,223
FIRING PIN AND EXTRACTOR MECHANISM FOR FIREARMS
Ralf E. Dieckmann, Stratford, Conn., assignor to Bridgeport Firearms Company, Monroe, Conn.
Filed Nov. 8, 1968, Ser. No. 774,325
Int. Cl. F41c *15/00*
U.S. Cl. 42—25R **6 Claims**

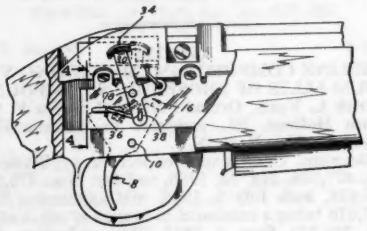
A firing and extracting mechanism for semi-automatic and automatic firearms in which a single unitary element performs both firing and extracting functions in sequence in conjunction with movement of the bolt on which the element is carried. The element is mounted on the bolt for

compound movement relative thereto, both longitudinally of the bolt and pivotally thereof about an axis transverse to the longitudinal axis of the bolt so that a firing portion



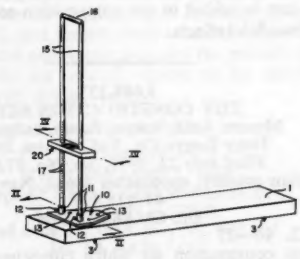
of the element can engage the rear face of a cartridge for firing it and an extractor portion can engage the rim of the cartridge for extracting it from the firing chamber.

3,608,224
SEAR-TRIGGER SAFETY MECHANISM FOR FIREARMS
Carl B. Hildebrandt, Springfield, Mass., assignor to Emhart Corporation, Bloomfield, Conn.
Filed Dec. 19, 1969, Ser. No. 886,716
Int. Cl. F41c *17/00, 17/08*
U.S. Cl. 42—70C **6 Claims**



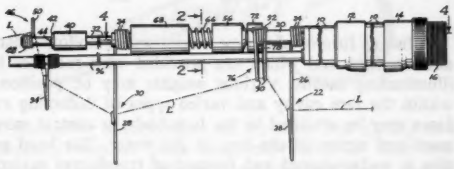
Safety mechanism for firearms having a trigger and sear combination in which the trigger has a portion engaged in a notch of the sear when the trigger is in its rest position. The trigger and sear are each pivotable for release of the trigger from the notch of the sear and include spaced opposed portions movable toward each other on said release of the trigger. A safety which has a portion movable between the spaced opposed portions of the trigger and sear and which is in compression therebetween when an attempt is made to pull the trigger.

3,608,225
PORTABLE GUN SUPPORT
Benjamin Manuel, 112 Arch St., Pittsburgh, Pa. 15212
Filed Feb. 25, 1970, Ser. No. 13,877
Int. Cl. F41c *29/00*
U.S. Cl. 42—94 **6 Claims**



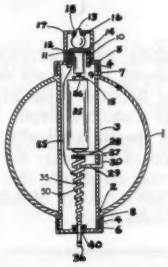
A portable gun support having a rectangular base, a removable support plate having attached thereto a pair of upright support rods with a barrel support member extending therebetween and adjustable along a portion of the length of said support rods.

3,608,226
FISHHOOK SETTING MECHANISM FOR FISHING RODS
Russell M. Stanley, Rte. 1, Box 576, Lebanon, Oreg. 97355
Filed June 24, 1969, Ser. No. 836,028
Int. Cl. A01k *97/00*
U.S. Cl. 43—15 **13 Claims**



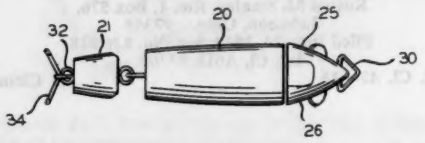
An elongated fishing line retractor rod is movable relative to a guide tube longitudinally forward, against the tension of a resilient retractor member, to a set position secured releasably by a lock interengaging a tube and a rod. In the set position a fishing line extends forward from a reel through a fixed eyelet, and then through a laterally offset and movable trigger eyelet, thence through at least one more fixed eyelet and around a retractor pin on the forward end of the retractor rod and thence through other fishing rod eyelets. When a fish pulls on the line, the portion thereof extending between the spaced fixed eyelets tends to straighten, moving the laterally offset trigger eyelet toward alignment with the fixed eyelets. The trigger eyelet thus release the lock and the retractor rod and pin is pulled resiliently rearward thereby pulling rearward on the fishing line sufficiently to set the hook in the fish.

3,608,227
ILLUMINATED FISHING FLOAT
Robert H. Adams, 826 Calle-Francita, Tucson, Ariz. 82706
Filed May 26, 1969, Ser. No. 827,520
Int. Cl. A01k *93/00*
U.S. Cl. 43—17 **7 Claims**



A battery powered fishing float having a bulb which is actuated by a bite or strike on the fishing line and a simple and inexpensive switch which makes or breaks the circuit through the use of a unique U-shaped, battery support and contact member. The light is off except when there is a bite or pressure on the line. Consequently, the device can be used for day or night fishing without appreciable drain on the battery.

3,608,228
FISHING LURE
Roy W. Borresen, 447 Lowell, Glen Ellyn, Ill. 60137, and Robert J. Meier, 2805 E. Hickory Drive, Wonder Lake, Ill. 60097
Filed Mar. 24, 1969, Ser. No. 809,647
Int. Cl. A01k *85/00*
U.S. Cl. 43—17.6 4 Claims



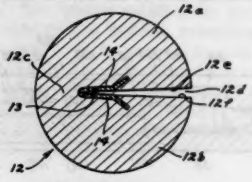
A fishing lure of plug type comprised of hollow detachable sections and which are provided with facilities for illuminating means. Various weights may be positioned within the lure cavity and varied types of deflecting surfaces may be attached to the lure body to control movement and action of the lure in the water. The head section is wedge-shaped and formed of translucent material to provide a prismatic effect for the illumination means to form eye-simulating circular illuminated areas on each side of the head section.

3,608,229
FISHING BOBBER FOR VARIABLE DEPTH FISHING
Cecil Ross, 3206 Locke Lane, Austin, Tex. 78704
Filed Apr. 21, 1969, Ser. No. 817,895
Int. Cl. A01k *93/00, 95/00*
U.S. Cl. 43—43.14 1 Claim

An improved fishing bobber adapted for fishing over a variable range of depth, having one sealed air tight compartment providing flotation capability to support a fish hook and sinker at a shallow depth. A second chamber having an opening therein gradually fills with water so that with the weight of the sinker the bobber will slowly sink through a range of depth, thereby permitting the fisherman to fish for a variety of fish at different levels with a single cast of the line.

3,608,230
SINKER FOR FISHING LINES
Joseph Hribar, 1600 N. Broadway, Joliet, Ill. 60435
Filed May 19, 1969, Ser. No. 825,635
Int. Cl. A01k *95/00*
U.S. Cl. 43—44.89 5 Claims

This disclosure relates generally to fishing line sinkers and more particularly to an improved split type sinker having a line-receiving slot which divides a major portion of the sinker into two segments which have cushioning and line gripping inserts interposed therebetween and which permit the sinker to be tightly clamped in the desired position onto the fishing line without damaging the line; and this disclosure also relates to the method and apparatus for making such sinkers.

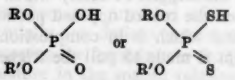


3,608,231
POUR DEPRESSANT COMPOSITION
William M. Sweeney, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 688,672, Dec. 7, 1967. This application Apr. 15, 1969, Ser. No. 816,373
Int. Cl. C10l *1/18*
U.S. Cl. 44—62 4 Claims

Pour depressant composition comprising a cracked and oxidized ethylene-propylene-dicyclopentadiene - terpolymer and mineral oil compositions containing same.

3,608,232
GASOLINE COMPOSITION CONTAINING VANADIUM SALTS OF PHOSPHORUS COMPOUNDS
Frederick L. Voelz, Orland Park, and Walter F. Schoen, South Holland, Ill., assignors to Atlantic Richfield Company, New York, N.Y.
No Drawing. Continuation-in-part of applications Ser. No. 427,078, Jan. 21, 1965, and Ser. Nos. 470,598 and 470,628, both July 8, 1965, said application Ser. No. 427,078 being a continuation-in-part of application Ser. No. 306,273, Sept. 3, 1963. This application Apr. 23, 1968, Ser. No. 723,580
Int. Cl. C01l *1/26*
U.S. Cl. 44—69 22 Claims

A gasoline composition consisting essentially of a hydrocarbon gasoline, an anti-knock quantity of a tetra-lower-alkyl lead compound, and a gasoline-soluble vanadium or chromium salt of a phosphorus compound having the formula

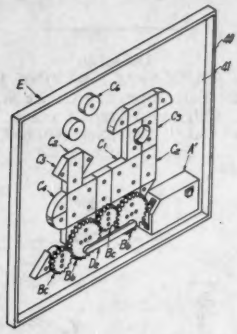


wherein R is a hydrocarbon radical of up to 30 carbon atoms, R' is selected from the group consisting of hydrogen and R, S is sulfur and O is oxygen. The amount of metal salt added is sufficient to provide about 0.002 to 0.8 milligram atoms, preferably about 0.025 to 0.3 milligram atoms, of the selected metal per gallon of gasoline. A gasoline soluble non-metallic auxiliary phosphorus compound can be added to the composition to provide additional beneficial effects.

3,608,233
TOY CONSTRUCTION SET
Masaru Aoki, Tokyo, Japan, assignor to Tomy Kogyo Co., Ltd., Tokyo, Japan
Filed July 22, 1970, Ser. No. 57,047
Claims priority, application Japan, Nov. 24, 1969, 44/111,597
Int. Cl. A63h *33/06*
U.S. Cl. 46—17 7 Claims

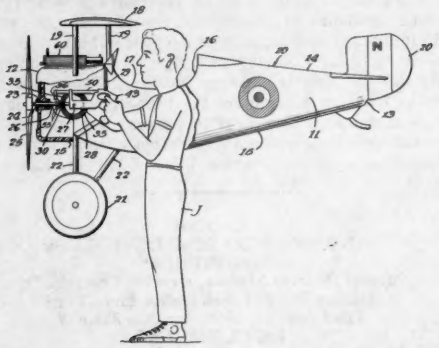
A toy construction set which comprises a variety of construction elements adapted to be assembled into a toy assembly of the desired type having a stationary portion and an operative portion. The construction elements in-

clude magnet-equipped elements adapted to be magnetically held on a magnetizable surface in assembled relation-



ship. The magnet-equipped elements include a power means for operating the operative portion of the toy to be assembled.

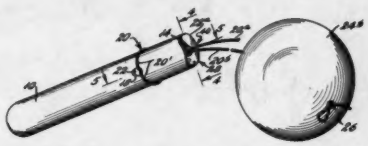
3,608,234
TOY AIRCRAFT VEHICLE
Richard C. Davidson, 6241 S. Paulina Ave., Chicago, Ill. 60636
Filed Dec. 29, 1969, Ser. No. 888,680
Int. Cl. A63h *1/32*
U.S. Cl. 46—47 **4 Claims**



A juvenile toy aircraft for simulating aircraft flying for juvenile operators having a light-weight fuselage body shell including an open lower end, a cut-out portion in the upper surface of the body shell, the undersurface of the cut-out portion adapted for seatment upon the shoulders of the juvenile operator along opposed lateral edges thereof, wing structure mounted on the upper surface of the body shell, tail structure mounted on the body shell adjacent the rear end thereof, a propeller, first hand-actuated means associated with the propeller for impelling the propeller, a simulated gun structure mounted on the body shell, and second hand-actuated means for providing simulated gun sounds whereby the juvenile operator may mount the toy aircraft vehicle on his shoulders to simulate aircraft flying.

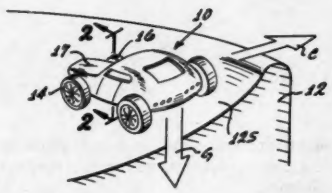
3,608,235
WHIRLING SKILL TOY
George G. Harton, 1624 Robinson Ave., Conway, Ark. 72032
Filed June 12, 1969, Ser. No. 832,604
Int. Cl. A63h *1/32*
U.S. Cl. 46—51 **9 Claims**

A toy including a cylindrical impelling and controlling handle adapted to be held substantially horizontally in the hand and pointed generally away from the body of the operator, the outermost end of the handle having a longitudinally extending open bore with two equilength cords or the like fixedly secured therein, each cord having an identical weighted ball, preferably rubber, tethered or securely attached to its free end, the said outermost end of the handle being provided with a substantially annular cam-like cord position deflecting surface thereon obliquely disposed with respect to the controller handle axis, whereby when equal and opposite circular or orbital movements are imparted to the tethered balls by manual



oscillation or manipulation of the controller handle in a generally vertical plane and responsive to their momentum, gravity and longitudinal positional control effected mechanically by the generally annular camming or deflecting surface on the end of the handle, such balls with be caused to freely pass each other during their rotary orbital movements maintained by the operator's skill in correlating the rate of rotation of the tethered balls with the rate and extent of up-and-down oscillatory movement he imparts to the impelling and position controller handle.

3,608,236
STEERABLE TOY VEHICLE
Janos Beny, Manhattan Beach, and John G. Tomkinson, Palos Verdes Peninsula, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Sept. 3, 1969, Ser. No. 854,890
Int. Cl. A63h *17/36*
U.S. Cl. 46—213 **6 Claims**

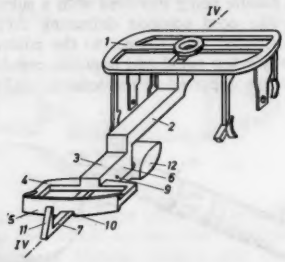


A toy vehicle with front wheels that tend to steer it around banked curves, wherein the wheels are rotatably mounted on their axle in a manner to permit wobbling of the wheels by up to about 20° from the straight-away direction.

3,608,237
TOY RAILROAD CAR WITH COUPLING MOUNTED ON A SWIVELLY MOUNTED TRUCK
Wolfgang Richter, Nuremberg, Germany, assignor to Ernst Paul Lehmann Patentwerk, Nuremberg, Germany
Filed Oct. 9, 1968, Ser. No. 766,075
Claims priority, application Germany, Oct. 13, 1967, P 16 03 422.3
Int. Cl. A63h *19/18*
U.S. Cl. 46—216 **7 Claims**

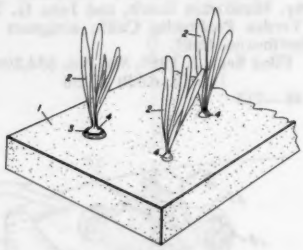
A coupling for the vehicles of toy and model railways comprising a hook at one end of a vehicle for engaging a stirrup of another vehicle at the opposite end thereof in which said hook is pivotally mounted and deflectable

downwardly against the force of a counter-weight, spring and such like tending to restore it to its normal undeflected position; the hook preferably being associated with a stirrup having a curved extremity as a buffer bar co-operating with a like curved extremity of the engaged



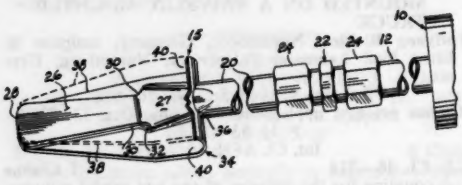
stirrup and the said parts conveniently being made of plastics material. The coupling is mounted on a wheel truck swivelly connected to the vehicle so that, on impact, it can automatically couple cars on curved as well as straight track sections.

3,608,238
PLANT CULTURE
Franz Gottfried Reuter, Lemfoerde, Hannover, Germany, assignor to Elise Erika Reuter, Lemfoerde, Hannover, Germany
Filed Jan. 27, 1969, Ser. No. 794,280
Int. Cl. A01g *31/00, 9/02*
U.S. Cl. 47—1.2 **7 Claims**



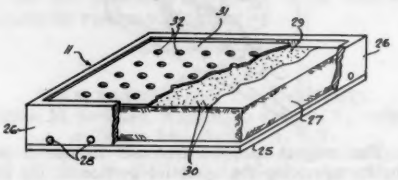
The plants are embedded in a polyurethane foamable matrix foaming a polyurethane reaction mixture about the roots of the plant.

3,608,239
TREE POISON INJECTOR NOZZLE
Clayton T. Tucker, 3100 Vickie Drive, Oklahoma City, Okla. 73115
Filed Dec. 16, 1968, Ser. No. 783,964
Int. Cl. B05b *1/28;* **B27k** *3/02*
U.S. Cl. 47—57.5 **1 Claim**



A tree killing poison injector nozzle comprising a tube having a wedge-shaped end portion for entering a cut formed in a tree. The opposing sides of the wedge-shaped end are cut away to define an opening at each of its sides. A poison directing guard, surrounding the tube, forms laterally open channels lying in the plane of the wedge-shaped end.

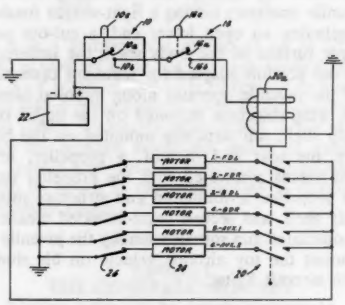
3,608,240
GREENHOUSE SPACE-SAVING DEVICE
Poon Yull Gunn, 204 Centre St. S., Calgary, Alberta, Canada
Filed Oct. 1, 1969, Ser. No. 862,666
Int. Cl. A01g *9/02*
U.S. Cl. 47—58 **4 Claims**



A method and apparatus for growing plants in stacked trays in a greenhouse. Perforated trays are slanted downwardly in alternate directions, successively. Liquid nutrients supplied to the top tray flow down tier after tier. Alternatively, easy flow is achieved by using a modified form of tray having outwardly and upwardly slanting sides with side holes inclined downwardly and outwardly.

A method and apparatus for successive growing cycles which eliminate soil aeration and cleaning between cycles. A multi-perforated paper layer over the soil is surmounted by a rigid layer having an array of holes defining a plurality of discrete growing locations. Plants are harvested from these locations. Fresh paper and rigid layers replace the first. The discrete growing locations in the second rigid layer are located differently from the first set. Successive rigid layers define different growing locations.

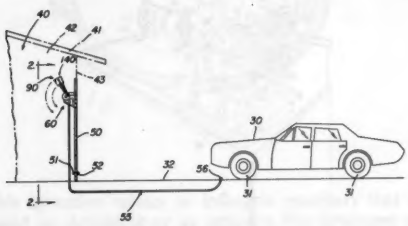
3,608,241
WINDOW OPERATING DEVICE FOR AUTOMOBILES
Miguel Rodrigo Mazure, Avenida Central 671, Oficina 504–505, San Isidro, Lima, Peru
Filed Apr. 16, 1969, Ser. No. 816,629
Int. Cl. B60j *1/08*
U.S. Cl. 49—72 **4 Claims**



An arrangement by which the windows of a car become automatically closed when the driver prepares to leave the automobile. A circuit closure to the window driving motors of the automobile is realized when the driver opens the door on his side and actuates the security latch. The circuit closure is formed through a switch actuated by the door and a switch actuated by the security latch. The switch actuated by the door becomes closed when

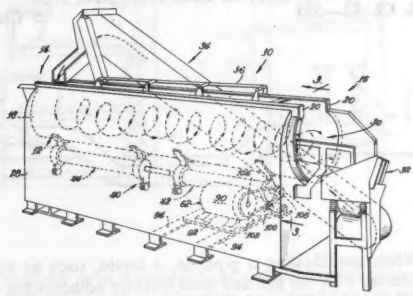
the door is opened, and the switch actuated by the security latch becomes also closed when the latch is actuated for the purpose of securing the door. The windows of the automobile become thereby closed before the driver closes the door and leaves the car.

3,608,242
DOOR-OPERATING MECHANISM
Donald F. Braun, 26 Gwynne St., Mount Waverley, Victoria, Australia
Continuation of application Ser. No. 733,856, June 3, 1968. This application Mar. 3, 1970, Ser. No. 16,231
Claims priority, application Australia, June 6, 1967, 22,758/67
Int. Cl. E05f *15/04*
U.S. Cl. 49—280 50 Claims



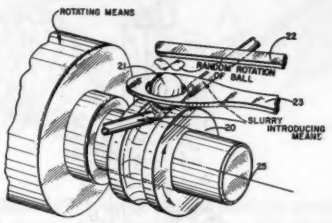
The door-operating mechanism is for use in sequentially manually opening then automatically closing then automatically opening and then manually closing a door that is arranged to be urged toward its closed position by gravity, the mechanism comprising a first latch mechanism having a first condition for holding the door in its open position and having a second condition for releasing the door, a door-opening weight connectable to the door for automatically pivoting the door from its closed position to its open position, a second latch mechanism having a first condition for connecting the door-opening weight to the door and having a second condition for holding the weight free of the door, an actuator for selectively operating the first and second latch mechanisms, and a selector for selectively rendering the actuator operable to change the condition of only one of the first and second latch mechanisms at one time.

3,608,243
VIBRATORY FINISHING MACHINE OF CONTINUOUS-FLOW TYPE
Achille K. Ferrara, Addison, Ill., assignor to Ultramatic Equipment Co., Addison, Ill.
Filed Feb. 25, 1969, Ser. No. 802,070
Int. Cl. B24b *19/00*
U.S. Cl. 51—7 11 Claims



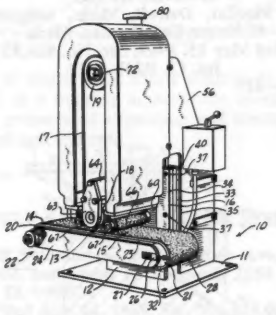
In a vibratory finishing machine, an elongated trough is vibrated so as to impart generally orbital movement to the contents about an axis disposed in a horizontal plane and oriented at a predetermined angle with respect to a vertical plane comprising the longitudinal axis of the trough.

3,608,244
CROSS RACEWAY LAPPING OF BALL BEARINGS
John F. Robinson, Newport Beach, Calif., assignor to North American Rockwell Corporation
Filed July 22, 1968, Ser. No. 746,575
Int. Cl. B24b *5/16*
U.S. Cl. 51—105R 5 Claims



A method and apparatus for randomly lapping a ball bearing race and removing the deviations from a smooth cross race curvature wherein the bearing race is rotated about its nominal center, a conforming ball in a slurry of fine abrasives is rotated in a highly random manner in the race thus transferring the uniform radius and finish of the ball to the bearing race surface.

3,608,245
BELT SANDING MACHINE
Raymond G. Fair, Jr., and Cecil D. Brotherton, Minneapolis, Minn., assignors to Timesavers Sanders, Inc., Minneapolis, Minn.
Filed Sept. 4, 1969, Ser. No. 855,196
Int. Cl. B24b *21/18, 21/04*
U.S. Cl. 51—135 3 Claims



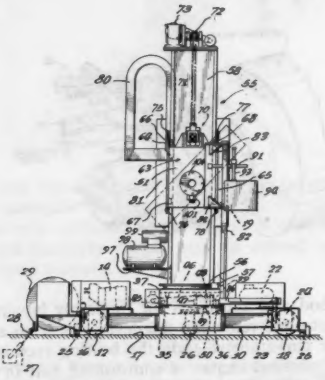
The idler drum of a belt sanding machine is supported cantilever style from an upright wall of the machine frame at a location a distance above a power driven contact drum, both for vertical motion relative to the contact drum and for tilting motion about a horizontal axis disposed close to said wall. The bed along which articles to be sanded are advanced under the contact drum, is mounted on a slide unit which is constrained to vertical adjusting motion along rails provided by the opposite side edges of the upright frame wall. A plain endless conveyor belt on the bed can be replaced by an abrasive belt of the same type and size provided for the contact and idler drums.

3,608,246

AUTOMATIC GRINDING MACHINE FOR GRINDING LONGITUDINAL EXTERNAL WELDS ON CYLINDERS

John Breckbill McCormack, Chicago, and Chester Arthur Harris, Jr., Western Springs, Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed July 3, 1969, Ser. No. 838,734
Int. Cl. B24b *21/00*
U.S. Cl. 51—135 25 Claims



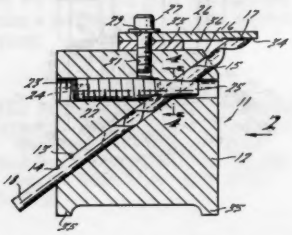
A grinding machine for grinding longitudinal external welds on large cylindrical metallic bodies. It grinds welds smooth adjusting automatically to changes in surface contour as grinding progresses from one end of the weld to the other end. Sensing probes cause the grinding means to rotate to effect grinding tangential to the cylindrical body.

3,608,247

GRINDING JIG

William O. Mueller, Detroit, Mich., assignor to Hans Sickinger Co., Pontiac, Mich.

Filed May 15, 1969, Ser. No. 824,939
Int. Cl. B24b *3/24*
U.S. Cl. 51—219 9 Claims



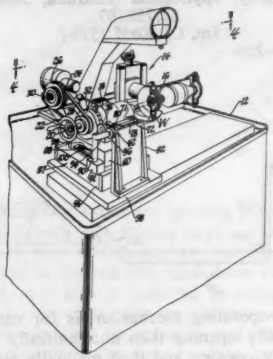
A method and means for regrinding single fluted drills, used to drill holes in stacks of loose leaf filler paper, in a manner which will maintain the proper cutting edge on the drill. The method includes feeding the drill along an inclined helical path a predetermined distance past a point at which the leading face is parallel to the plane of action of a grinder, locking the drill in place, and grinding the drill face down said predetermined distance. The means for carrying out the method comprises a jig having a plurality of inclined drill supporting holes, a combined guiding and locking screw for each drill, and a locating plate pivotally mounted on the jig.

3,608,248

FORM RELIEVING APPARATUS

Raymond F. Nixon, Bloomfield Hills, and Addison S. Prout, Orchard Lake, Mich., assignors to Omark-Winslow Aerospace Tool Co., Arcadia, Calif.

Filed Feb. 4, 1969, Ser. No. 796,442
Int. Cl. B24b *19/00, 47/10*
U.S. Cl. 51—225 13 Claims



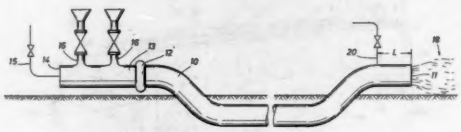
Form relieving apparatus including a workpiece supporting carriage non-rotatably and rectilinearly movably mounted on a base, and actuating means operable to reciprocate the carriage relative to the base along either selected one of two transverse paths or along any selected path extending between the transverse paths and through the intersection thereof. The actuating means includes adjustment means for selectively varying the distance moved by the carriage along its selected path. The actuating means comprises a pair of levers engaged with the carriage each operable to move the carriage along one of the transverse paths. The levers are operated by a rotatable cam mounted on the carriage.

3,608,249

METHOD FOR PREVENTING FIRES DURING PIPELINE SANDBLASTING OPERATIONS

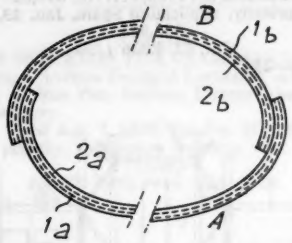
Lester C. Sullivan, Houston, Tex., assignor to Trunkline Gas Company, Houston, Tex.

Filed Aug. 3, 1970, Ser. No. 60,277
Int. Cl. B08b *9/02*; B24b *1/00*; B24c *1/00*
U.S. Cl. 51—321 5 Claims



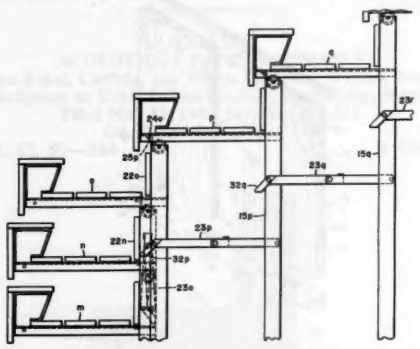
When sandblasting a pipeline, a liquid, such as water, is injected into the gas and sand mixture adjacent the outlet of the line. This provides a ground connection for the sand and other solid particles carried by the gas stream to discharge any static electrical charge that may build up on these particles as they travel through the line before the gas stream with the particles enters the atmosphere.

3,608,250
INFLATABLE STRUCTURAL MEMBERS
Roger Eugene Ducrocq, Clermont-Ferrand, France, assignor to Pneumatiques, Caoutchouc Manufacture et Plastiques Kleber-Colombes, Colombes, France
Filed July 22, 1969, Ser. No. 843,641
Claims priority, application France, July 24, 1968, 160,498
Int. Cl. E04b 1/345
U.S. Cl. 52—2 3 Claims



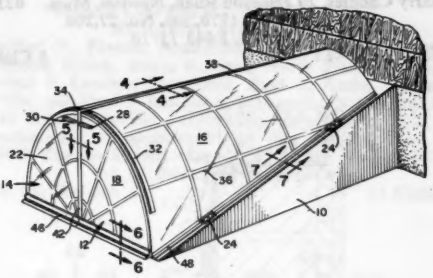
This invention relates to inflatable members that can be used as structures or as supports for structures and a member comprises at least two parts having different extension characteristics, each of these parts being made of an elastic material reinforced by at least two layers formed of mutually parallel elements which are superimposed and crossed symmetrically relatively to the longitudinal direction of the member so that the angle formed by one of the elements of one of the parts is different from the angle formed by the elements of the other part.

3,608,251
UPPER ROW LOCK LINKAGE
Robert T. Scaggs, Urbana, Ill., assignor to American Seating Company, Grand Rapids, Mich.
Filed June 12, 1970, Ser. No. 45,799
Int. Cl. E04h 3/12
U.S. Cl. 52—9 6 Claims



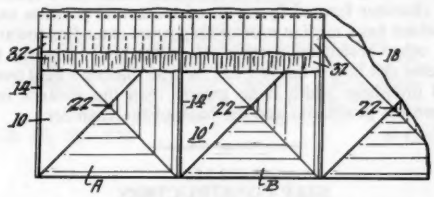
The upper rows particularly of post-supported telescoping platforms, such as bleachers and the like, are automatically locked and braced by linkage between the posts when the posts are opened to expanded position and automatically unlocked as the platforms are moved one by one to closed position.

3,608,252
COMBINATION HATCHWAY-HOTHOUSE
Joseph R. Bisson, 3 Valley Crest Drive, West Hartford, Conn. 06110
Filed Nov. 5, 1969, Ser. No. 874,243
Int. Cl. E02d 29/14; E04b 7/16
U.S. Cl. 52—19 8 Claims



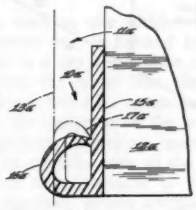
Greenhouse structure of at least partially arcuate cross-sectional shape which opens to either side along the top center line. The structure is transparent, preferably comprised of molded plastic and may be substituted for building hatchway doors.

3,608,253
SNOW AND ICE BELT FOR ROOFS
George R. Theriault, 580 S. Main St., Orange, Mass. 01364
Filed Oct. 16, 1969, Ser. No. 866,871
Int. Cl. E04b 7/16; E04d 3/40, 13/06
U.S. Cl. 52—24 2 Claims



A series of interlocking sheets adapted to be arranged on the roof of a building adjacent the eaves, said sheets having the property of expanding and contracting under conditions of heat and cold.

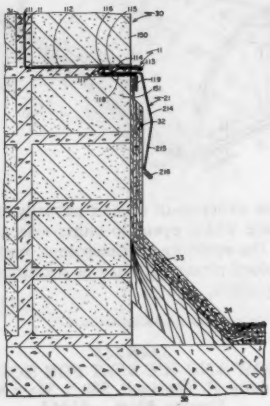
3,608,254
SELF ADJUSTING FILLER STRIP FOR WALL GAP
Lawrence R. Sklamberg, 704 S. Lyman Ave., Oak Park, Ill. 60302, and Lewis R. Rozenoff, 1654 Jarvis Ave., Chicago, Ill. 60626
Filed Apr. 24, 1969, Ser. No. 819,008
Int. Cl. E06b 7/16
U.S. Cl. 52—27 7 Claims



For use with a wall gap present in the mounting of wall cabinets, panels and the like, an elongated yieldable

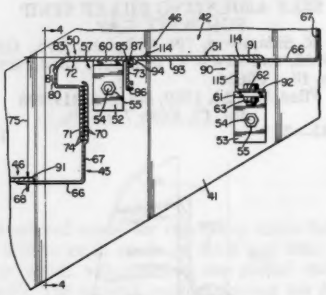
filler strip having a hollow bulge portion resiliently and wedgingly deformable rearwardly in the gap from being wedged between the surfaces defining the gap.

3,608,255
FLASHING CAP RECEIVER
Harry Chomes, 29 Jameson Road, Newton, Mass. 02158
Filed Apr. 10, 1970, Ser. No. 27,206
Int. Cl. E04d *13/14*
U.S. Cl. 52—61 **3 Claims**



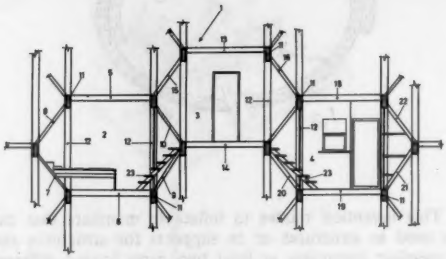
A flashing cap receiver is described which has a receiving chamber formed by a pair of horizontal portions one of which has a median protrusion portion extending toward the other horizontal portion. The chamber is adapted to receive and hold a flashing cap member having a bent over end lip whose width is no greater than the distance between the protrusion and the back of the chamber.

3,608,256
STEP CONSTRUCTION
Henry J. Jefferys, Manakin Sabot, Va., assignor to Reynolds Metals Company, Richmond, Va.
Original application Dec. 1, 1967, Ser. No. 687,174, now Patent No. 3,499,254, dated Mar. 10, 1970. Divided and this application Oct. 15, 1969, Ser. No. 870,871
Int. Cl. E04f *11/00*
U.S. Cl. 52—182 **22 Claims**



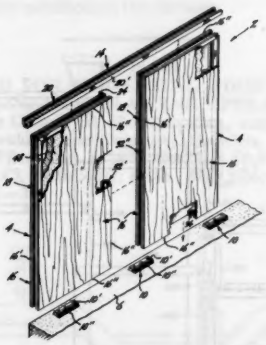
This disclosure relates to a step assembly having a riser which is adjustable and a tread comprised of a tread nosing and a reversible tread pan which defines a horizontal surface in one of its positions and provides an integral pan-like mold for receiving a step-forming material in its reversed position.

3,608,257
ASSEMBLY OF HEXAGONAL MODULES
Francisco Fernandez-Castanys Lopez and Emilio Gonzalez Espinosa de los Monteros, both of 2 Muelle de Heredia, Malaga, Spain
Filed Jan. 23, 1968, Ser. No. 699,827
Claims priority, application Spain, Jan. 23, 1967, 335,954
Int. Cl. E04h *1/00*
U.S. Cl. 52—236 **2 Claims**



A dwelling contains the rooms in honeycomb arrangement so that the inclined upper half walls of one room are available as inclined floor space in adjoining rooms of a higher level.

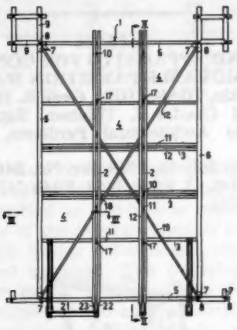
3,608,258
REMOVABLE MULTIPANELED WALL CONSTRUCTION
Virgil E. Spratt, Edmonds, Wash., assignor to Unilith Enterprises, Inc., Seattle, Wash.
Filed Apr. 17, 1969, Ser. No. 816,896
Int. Cl. E04b *2/18, 2/74;* **E04c** *1/10*
U.S. Cl. 52—241 **5 Claims**



A hollow double-walled building panel is disclosed which is adapted to be marginally interconnected with one or more other such panels to form a rigid but readily removable wall construction of the same. The panel comprises a pair of flat, parallel wall members which are registered opposite one another with a clearance therebetween; and pairs of elongated framing members which are interposed in the clearance between the wall members along the opposite edge portions of the panel. At

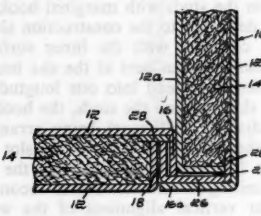
least one pair of the framing members are similarly oriented in the panel and have matching convexo-concave bodies in transverse planes thereof, the relatively raised and recessed male and female faces of which complementally jam lock with one another from one panel to the next, and project relatively outwardly and inwardly from the adjacent edges of the wall members, respectively, so that the panels can be jam locked in abutting edge-to-edge relationship with one another, along the joints therebetween.

3,608,259
FLOOR SKELETON FOR RESISTANCE FRAME
Jean Iwens, 1 Avenue Edouard Lacomble, and Andre De Poerck, 49 Rue Pere Eudore, Devroye, both of Etterbeek, Belgium
Filed Apr. 7, 1969, Ser. No. 814,124
Claims priority, application Belgium, Apr. 10, 1968, 713,483
Int. Cl. E04b *1/24;* E04c *3/04*
U.S. Cl. 52—263 **4 Claims**



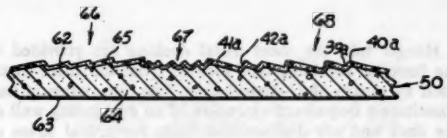
A floor framing skeleton comprising a structural unit having two layers of beams framed by four bearing girders. The beams of one layer are supported by two of the girders and the beams of the other layer support the other girders.

3,608,260
ACOUSTICAL PANEL ASSEMBLY
Alan Eckel, Carlisle, and Oliver C. Eckel, Weston, Mass., assignors to Eckel Industries, Inc., Cambridge, Mass.
Filed May 21, 1969, Ser. No. 826,351
Int. Cl. E04b *1/348, 2/08*
U.S. Cl. 52—284 **1 Claim**



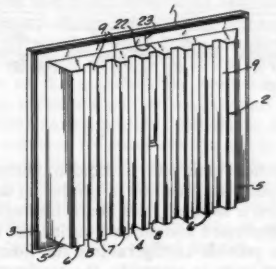
Acoustical panels carry extensions or joiners at each of two opposite sides which are spaced from the main body of the panel and extend alternately downward and upward, said spaces providing receiving recesses open at the top and bottom respectively, that joiners of the nearest adjacent panel enter. At corners of the assembly separate right angle joiners extend into recesses each panel provides thereby connecting the corner panels.

3,608,261
SHEET COVERING MEMBERS FOR BUILDING SURFACES
Clayton V. French, Somerville, Stanley E. Jastremski, Bound Brook, James E. Neal, North Plainfield, Norman S. Greiner, Somerville, Paul L. Earle, Martinsville, and Fred T. Randolph, Somerville, N.J., assignors to Johns-Manville Corporation, New York, N.Y.
Continuation of application Ser. No. 598,772, Dec. 2, 1966. This application Mar. 28, 1969, Ser. No. 812,963
Int. Cl. B44f *9/02;* E04c *2/04*
U.S. Cl. 52—316 **11 Claims**



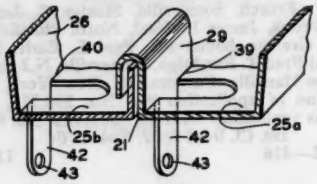
This invention relates to sheet covering members for building surfaces and especially to asbestos-cement shingles and strips for roofing and siding. The covering members each comprise a base member and a denser veneer covering on said base. The covering members can be textured to simulate a natural wood grain.

3,608,262
SPLICE JOINT DOOR LINER PANEL
Robert J. Smith, Lansing, Mich., assignor to The General Tire & Rubber Company, Akron, Ohio
Filed May 1, 1969, Ser. No. 820,956
Int. Cl. E04d *1/08;* E04c *2/16*
U.S. Cl. 52—524 **8 Claims**



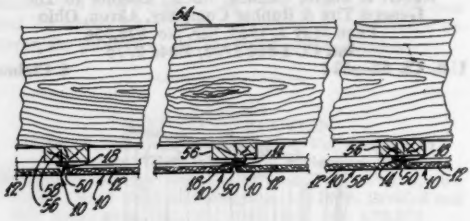
A door liner, such as one which would be used in a railroad refrigerator car, is formed of two half panels which are joined in a lap joint splice along a center line of the liner. Along the center line, the half panels have opposing matching half-ribs extending from opposing ends to meet at the midpoint on the line, where the ribs are offset to provide opposing, matching, underlying webs extending to opposite ends of the center line. Complementary splice slots disposed at the offsets permit interlocking of the half panels so that the half rib of the first panel overlaps the matching underlying web of the second panel and the matching rib of the second panel overlaps the underlying web of the first panel.

3,608,263
HANGER TABS FOR SHEET METAL DECKING SECTIONS
Rodney W. Gartner, Coraopolis, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.
Filed Nov. 13, 1969, Ser. No. 876,444
Int. Cl. E04b 5/38, 5/55
U.S. Cl. 52—588 4 Claims



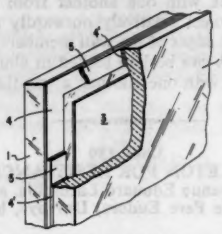
Hanger tabs for sheet metal decking are provided in the form of bendable tabs formed from the sheet metal itself by means of U-shaped slots. The tabs, when in use, constitute a downward extension of an upstanding wall of the deck and are disconnected from horizontal strips of the deck.

3,608,264
MOLDED FIBROUS SURFACING UNIT
Isaac Palmer Jones, Granville, Daniel A. McCartan, and Jared R. Kies, Newark, and Merritt W. Seymour, Toledo, Ohio, assignors to Owens-Corning Fiberglas Corporation
Continuation of application Ser. No. 661,914, Aug. 21, 1967. This application Sept. 4, 1969, Ser. No. 856,900
Int. Cl. E04b 5/54; E04c 2/10; E04f 13/16
U.S. Cl. 52—593 14 Claims



This invention embraces a molded fibrous surfacing unit, tile or panel and method of producing same wherein a mass of fibers, such as glass fibers, impregnated with a binder is compressed and shaped during the compressing operation to provide configurations for interengagement with adjacent units in assembly, the configurations being of a character providing alignment of the units in assembly and facilitating the securing of the units to a support means.

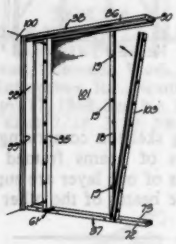
3,608,265
GLAZING UNIT AND METHOD OF MAKING SAME
Gérard Meunier, Jumet, Belgium, assignor to Glaverbel, S.A., Watermael-Boitsfort, Belgium
Filed Jan. 11, 1965, Ser. No. 424,580
Claims priority, application Luxembourg, Mar. 11, 1964, 45,630
Int. Cl. E06b 3/66
U.S. Cl. 52—616 13 Claims



The present invention relates to a novel glazing unit and to a method of manufacture thereof, and is particularly concerned with a glazing unit of the type in which two glass sheets are assembled in parallel spaced relation to form the unit.

Glazing units of the nature referred to are known, and are generally provided for the purpose of reducing to a minimum the transfer of heat through the glazing unit.

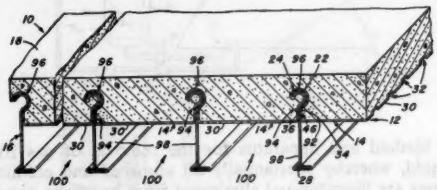
3,608,266
METHOD AND APPARATUS FOR CONSTRUCTING REMOVABLE PARTITION WALLS
David M. Satkin, Hidden Hills, Gene B. Helvie, Newport Beach, and Charles J. Tillotson, Sepulveda, Calif., assignors to Architectural Partitions, Los Angeles, Calif.
Filed July 31, 1969, Ser. No. 846,379
Int. Cl. E06b 3/64; E04b 2/76
U.S. Cl. 52—741 7 Claims



A wall structure in which channel-shaped studs are supported in spaced relationship by channel ceiling and floor runners, the parallel legs of the studs providing side surfaces having laterally spaced pairs of slots at longitudinally spaced intervals, wall forming panels being removably mounted on the studs with marginal hook members. The panels are delivered to the construction site with the hook members coplanar with the inner surface of the panels. The hooks are then bent at the site into inwardly projecting position to extend into one longtudinal set of the slots of the slot pairs on the studs, the hook members of the other adjacent wall panel being arranged to extend into the other set of the slots of the slot pairs. The studs rest upon floor wedges which lock the studs into registry with a ceiling runner which thus becomes the reference point for vertical alignment of the wall panels. The wall structure is assembled by wedging a first stud in vertical alignment in registry with the ceiling runner, hanging a first wall panel from the stud, placing a second stud askew between wall and ceiling runners and rotating or twisting the stud into final position by engaging the unattached marginal hooks of the first panel in the slots of the stud and then lifting the stud against the ceiling

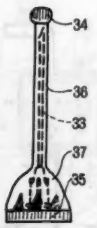
runner and wedging the stud in that reference position, which relates the hooks and the stud in final engagement. Succeeding wall panels are hung and succeeding studs put in place in like manner, while the panels of the other wall face are attached during or after the construction of the first wall face.

3,608,267
FLOOR STRUCTURE AND BUILDING CONSTRUCTION PANEL THEREFOR
Bernard E. Curran, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.
Original application Oct. 9, 1968, Ser. No. 766,048. Divided and this application May 13, 1970, Ser. No. 36,916
Int. Cl. E04b *5/40, 5/36*
U.S. Cl. 52—332 9 Claims



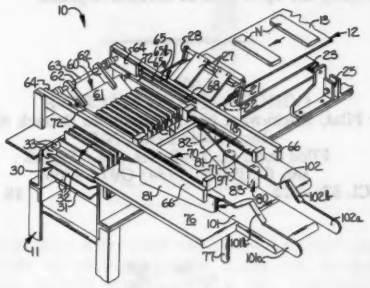
An improved floor structure assembled from concrete and building construction panels of unique design. The panels are assembled in side-by-side interengaged relation. The upside of the assembled panels presents a plurality of troughs having deformations and keying elements associated therewith. The overlying concrete is united with the panels as a composite floor structure capable of developing improved load-carrying capacities. The underside of the assembled panels presents a plurality of channels which may be adapted to provide any one of a variety of finished ceiling arrangements.

3,608,268
METHOD FOR PRODUCING THIN-WALLED, COLLAPSIBLE CONTAINERS OR PACKAGES
Erik Lauritzen, Gentofte, Denmark, assignor to Niels Bay-Schmith, Mosebakken, Virum, Denmark
Filed June 3, 1968, Ser. No. 733,926
Claims priority, application Denmark, June 7, 1967, 2,988/67
Int. Cl. B65b *43/00;* B29c *17/00*
U.S. Cl. 53—29 7 Claims



A method for producing thin-walled, collapsible packages each having a protruding, relatively thick-walled tubular body for holding a hypodermic needle by: (a) inflating an intermediate part of a stiff tubular blank of thermoplastic material in heated condition to a small wall-thickness, usually less than $\frac{1}{100}$ inch, while the adjacent blank parts are not inflated to any substantial degree, (b) cutting the inflated part transversely, (c) inserting the needle portion of the hypodermic into the adjacent blank part, and (d) heat-sealing the opposite ends of the package. The degree of inflation and the shape of the resulting package may be controlled by inflating in a mould cavity, or by heating the blank only along the longitudinal parts which are to be inflated.

3,608,269
APPARATUS FOR HANDLING AND PACKAGING INDIVIDUAL ARTICLES
Graves T. Gore, Ware Shoals, S.C., assignor to Riegel Textile Corporation, Ware Shoals, S.C.
Filed Sept. 24, 1969, Ser. No. 860,619
Int. Cl. B65b *57/10*
U.S. Cl. 53—62 8 Claims

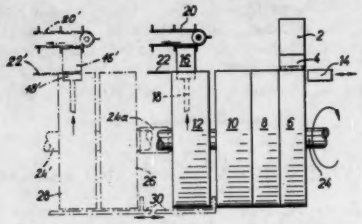


A feeding conveyor successively feeds individual articles along a predetermined path to an accumulating conveyor in series with the feeding conveyor. The accumulating conveyor includes side-by-side article receiving compartments and is successively advanced in timed relationship to the feeding conveyor to sequentially receive articles therefrom. After a predetermined number of articles have accumulated on the accumulating conveyor, they are simultaneously ejected from the compartments in side-by-side relation transverse to the path of advancement of the accumulating conveyor. Preferably, the apparatus includes a pair of spaced apart cooperating guide conveyors having portions converging from the accumulating conveyor for receiving the articles upon ejection, maintaining the articles in side-by-side relation, advancing the articles and compressing the articles. In addition, package aligning members communicate with the guide conveyors for aligning and holding an article receiving package relative to the ejected articles.

3,608,270
MACHINE FOR PACKAGING ROD SHAPED ARTICLES
Willy Rudszinat, Dassendorf, Otto Erdmann, Hamburg-Bergedorf, and Wolfgang Zausch, Hamburg, Germany, assignors to Hauni-Werke Koerber & Co. K.G., Hamburg-Bergedorf, Germany
Continuation-in-part of application Ser. No. 582,106, Sept. 26, 1966. This application May 26, 1969, Ser. No. 827,808
Claims priority, application Germany, Oct. 12, 1965, H 57,397
Int. Cl. B65b *19/04, 19/24, 63/02*
U.S. Cl. 53—124E 64 Claims

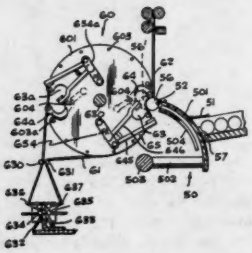
Cigarettes or like rod-shaped smoking articles are introduced into and sealed in packs by withdrawing them

from a magazine, moving the thus withdrawn articles sideways and assembling moving articles into block-



shaped groups, converting blanks of sheet material into open-ended packs which accommodate groups of articles, and sealing the open ends of successive packs.

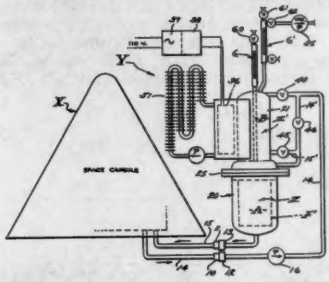
3,608,271
COIN WRAPPING MACHINE
Peter Pilat, Rockaway, N.J., assignor to Broach Systems, Inc., Little Ferry, N.J.
Filed Sept. 12, 1968, Ser. No. 759,322
Int. Cl. B65b *11/34;* **G07d** *9/00*
U.S. Cl. 53—212 **18 Claims**



A machine is disclosed preferably for wrapping coins, and includes a conveyor and inclined plate means for assembling a plurality of coins on edge adjacent one another to form a roll of loose coins, and means for moving the roll of loose coins away from the area where the coins were assembled. Coin wrapping means are provided for receiving the roll of loose coins and thereafter wrapping a sheet of film material around the loose coins. This coin wrapping means includes a wrapping head having at least one cavity therein, an extensible belt substantially surrounding the head, means for placing the sheet between the belt and the loose roll of coins, means for urging the roll of coins against the sheet and into the cavity, and means for rotating the wrapping head relative to the belt after receiving the coin roll to wrap the sheet around the coin roll.

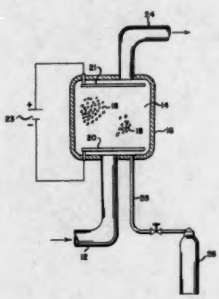
The machine may also include a gripping means for holding the roll of loose coins at its end as the coins move as a roll into the wrapping head, means operatively coupled to the gripping means for separating the gripping means from the roll of coins after the coin roll has been urged against the sheet and belt into the cavity, and jaw means pivotally located on the wrapping head for holding the roll within the cavity. Once the coin roll has been wrapped a heat sealing means may be provided to seal the film about the coin roll.

3,608,272
GAS FROM LIQUID SEPARATION METHOD AND APPARATUS
Leonard J. Di Peri, 18325 Lahey St., Northridge, Calif. 91324, and Kenneth H. Brown, Fullerton, Calif. (15005 SE. Robinett Court, Milwaukie, Oreg. 97222)
Filed Dec. 16, 1968, Ser. No. 783,850
Int. Cl. B01d *19/00, 51/08*
U.S. Cl. 55—15 **9 Claims**



Method and apparatus for the removal of gas from liquid, whereby substantially all absorbed and entrained gases are liberated and eliminated from hydraulic systems and preferably closed systems and the like; providing for the circulation of primary hydraulic system fluid with complementary hydraulic system fluid, and with the provision of a surface tension device that collects dimensionally large entrained gas bubbles; providing for separation from circulation of a body of fluid to be batch processed and replaced into circulation for commingling in said primary-complementary systems, and with the provision of vacuumization and sonic energy application to be applied to said separated batch of fluid whereby gas liberation therein is stimulated and the time required therefor reduced to a practical minimum; and providing for repeated batching and commingling until saturation becomes insignificantly small and acceptable as may be prescribed.

3,608,273
APPARATUS AND PROCESS FOR DESORPTION OF FILTER BEDS BY ELECTRIC CURRENT
Bela M. Fabuss, Winchester, and Wilson C. Du Bois, Tyngsboro, Mass., assignors to Lowell Technological Institute Research Foundation, Lowell, Mass.
Filed Jan. 15, 1969, Ser. No. 791,339
Int. Cl. B01d *53/02*
U.S. Cl. 55—74 **7 Claims**



Apparatus for use in adsorption of contaminants from fluid streams, said apparatus comprising a particulate adsorbent which is sufficiently conductive to be susceptible

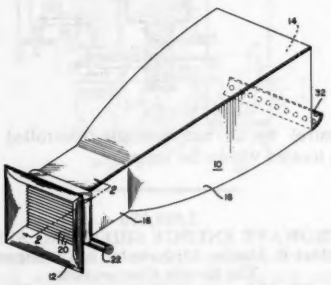
to direct heating by an electrical resistance heating means for periodically heating the contaminant-laden adsorbent to a temperature effective to free it of the contaminants and thereby prepare it for further use without need of removing it from said apparatus.

3,608,274

APPARATUS AND METHOD FOR PUMPING AND CLEANING A FLUID

Valentin Stingelin, Geneva, Switzerland, and Jules L. Dussourd, Princeton, N.J., assignors to Ingersoll-Rand Company, New York, N.Y.

Filed Jan. 27, 1969, Ser. No. 794,025
Int. Cl. B01d 47/00
U.S. Cl. 55—84 14 Claims



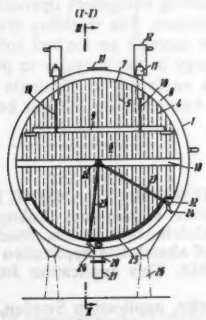
A method, and apparatus for the practice thereof, involving the use of a conduit open at both ends for conducting a moving, polluted fluid, such as gas, therethrough. The conduit has an inlet, mixing section along its length, and an outlet, expansion section of generally diverging cross-section. Atomizers or spray jets are arranged within the inlet to finely spray a fluid, more dense than the polluted fluid, such as a liquid, in uniform distribution into the mixing section, at a velocity which approximates and a direction which is the same as that of the polluted fluid.

3,608,275

ELECTROSTATIC PRECIPITATOR

Jean Wiemer, Oberhochstadt, and Franz Hauss, Frankfurt, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Germany

Filed Nov. 20, 1969, Ser. No. 878,505
Claims priority, application Germany, Jan. 7, 1969, P 19 00 526.6
Int. Cl. B03c 3/76
U.S. Cl. 55—112 7 Claims



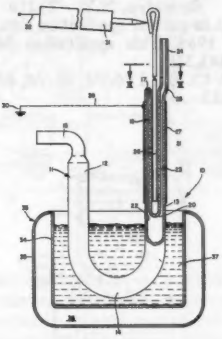
An electrostatic precipitator for collecting dust, comprising a horizontal cylindrical pressure housing having a gas inlet at one end, a gas outlet at the other and a dust discharge opening in the bottom, plate-like collecting electrodes therebetween and defining parallel horizontal gas passages between the inlet and outlet, and charging electrodes between the collecting electrodes, and means for removing the collected dust from the housing.

3,608,276

GAS CHROMATOGRAPHY COLLECTOR

James L. Bloomer, Philadelphia, Pa., assignor to Temple University of the Commonwealth System of Higher Education, Philadelphia, Pa.

Filed Dec. 24, 1968, Ser. No. 786,664
Int. Cl. B03c 3/01
U.S. Cl. 55—126 6 Claims



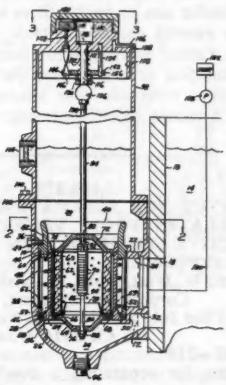
An apparatus is provided for collecting small samples from gases by chromatographic techniques by precipitating the desired sample from a gas containing the desired sample.

3,608,277

RESERVOIR FILTER AND INDICATOR

Nils O. Rosaen, Bloomfield Hills, Borje O. Rosaen, Ann Arbor, and Oscar E. Rosaen, Grosse Pointe Farms, Mich., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

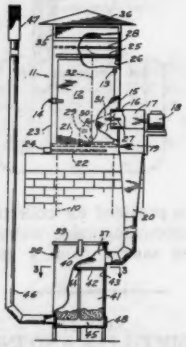
Application Aug. 1, 1966, Ser. No. 519,488, now Patent No. 3,440,802, which is a continuation-in-part of application Ser. No. 522,773, Jan. 24, 1966. Divided and this application Jan. 28, 1969, Ser. No. 794,612
The portion of the term of the patent subsequent to Apr. 29, 1986, has been disclaimed and dedicated to the Public
Int. Cl. B01d 19/00
U.S. Cl. 55—199 2 Claims



A filter device is adapted to be mounted to the exterior of a sidewall of a fluid reservoir and includes a housing

section having a fluid inlet connected with the reservoir and a fluid outlet. The housing section defines a filter chamber fluidly intermediate the inlet and the outlet and disposed below the fluid level of the reservoir. A tubular section extends upwardly from the housing section and a filter element is vertically slidably disposed in the filter chamber. A rod extending upwardly from the filter element provides a means for withdrawing the filter element upwardly from the filter chamber.

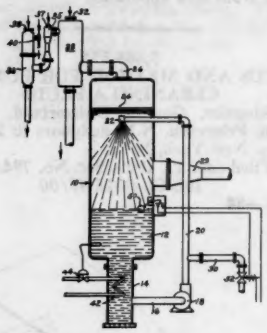
3,608,278
APPARATUS FOR FILTERING AND COLLECTING SOLID MATTER FROM A SMOKE FLOW
Saul Greenspan, 1335 E. 38th St., Brooklyn, N.Y. 11210
Continuation-in-part of application Ser. No. 604,364, Dec. 23, 1966. This application July 22, 1969, Ser. No. 843,310
Int. Cl. B01d *46/04, 46/10, 46/86*
U.S. Cl. 55—212 **9 Claims**



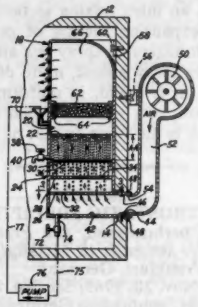
A device having a housing fitted upon a chimney or other smoke outlet, the housing containing a heater or burner, a grate and one or more smoke filters past which the outgoing smoke flows. A suction blower exerts suction in a direction transverse to the smoke flow to thereby draw off any solid material such as soot, residue, flakes, ashes or the like created by the combustion or incineration and entrained in the smoke. The suction causes the solid material to be delivered into a collection chamber to which the outlet of the blower is connected. The heater or burner reduces large particles of the solid material to smaller size to enable them to be readily carried off by the exerted suction. Suitable louver and damper means are further providing for increasing efficiency of forced circulation as is apparatus for making the forced flow direction reversible and alternating the direction thereof as a means of self-cleansing of the filters of the system.

3,608,279
APPARATUS FOR SEPARATING FATTY ACID DISTILLATES FROM VEGETABLE OILS BY SELECTIVE CONDENSATION AND TEMPERATURE CONTROL
Richard W. West, Irwin, Pa., assignor to Carrier Corporation, Syracuse, N.Y.
Filed July 24, 1964, Ser. No. 384,935
Int. Cl. B01d *3/34*
U.S. Cl. 55—219 **3 Claims**

Apparatus for separating a condensable constituent from a vaporous mixture by passing liquid in heat transfer relation with the vaporous mixture in a vessel under pressure enabling the desired constituent only to be condensed, wherein the liquid is previously recovered condensate flowing in a separate circuit subject to temperature control by an automatically controlled heat exchanger located within the vessel.



3,608,280
MICROWAVE ENERGY SHIELDING SYSTEM
Robert B. Martin, Mishawaka, Ind., assignor to The Bendix Corporation
Filed Mar. 26, 1969, Ser. No. 810,571
Int. Cl. B01d *47/00*
U.S. Cl. 55—222 **7 Claims**

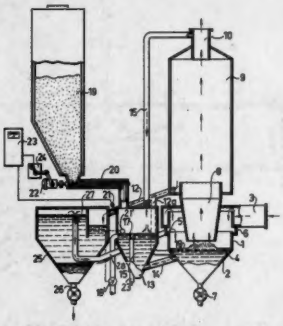


A microwave energy shielding system for use in an opening through which fresh air is supplied to personnel and sensitive testing equipment operating within the confines of an enclosure. The shielding system passes the required air flow through an ionized solution to attenuate microwave energy in the air prior to passing through the opening in the enclosure to eliminate the effect of any outside micro frequency on the test being performed by the equipment.

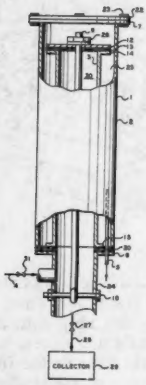
3,608,281
APPARATUS FOR CLEANSING FLUE GASES
Karl-Axel Göran Gustavsson, Enkoping, Sweden, assignor to Aktiebolaget Bahco, Stockholm, Sweden
Continuation of abandoned application Ser. No. 763,424, Sept. 27, 1968. This application June 19, 1970, Ser. No. 48,928
Claims priority, application Sweden, Oct. 19, 1967, 14,347/67
Int. Cl. B01f *3/04*
U.S. Cl. 55—228 **6 Claims**

The invention relates to an apparatus for purifying the gases to remove sulphur dioxide. The apparatus com-

prises a container for a body of treatment liquid and is provided with a gas inlet so arranged that the gas is caused to flow substantially at right angles to the surface of the liquid therein. A treatment passage extends substantially vertically upwards from the liquid surface in the container, so that the gas after contact with the liquid flows substantially linearly therethrough entraining droplets of liquid. The container communicates below the liquid level with an equalizing tank having means for introducing alkali thereinto to maintain the treatment liquid at a suitable alkalinity and with means for introducing fresh water. The equalizing tank also has means to maintain the liquid level therein constant whereby the liquid level in the treatment container adjusts automatically to variations in the rate of gas supplied thereto.

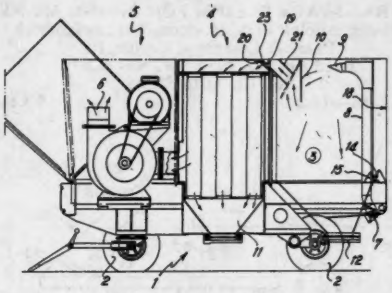


3,608,282
FILTERING SYSTEMS
Otis E. Ririe, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Dec. 13, 1968, Ser. No. 783,653
Int. Cl. B01d *46/04*
U.S. Cl. 55—302 **4 Claims**



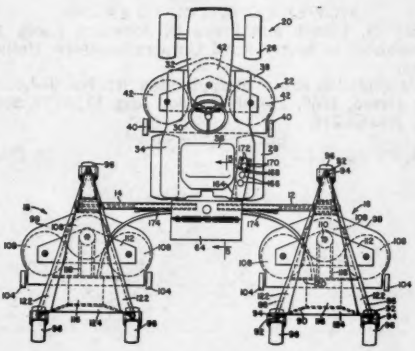
An apparatus for separating particulate matter from a fluid stream which involves means for passing the fluid stream through a filter, means reversing the flow of the fluid to remove the matter from the filter and permitting the removed matter to pass into porous collecting means.

3,608,283
MOBILE SUCTION CLEANERS FOR PULVERULENT MATERIAL
Bernard J. Huglo, Amiens, France, assignor to Manutair, Amiens, France
Filed Oct. 29, 1968, Ser. No. 771,438
Claims priority, application France, Nov. 10, 1967, 127,716
Int. Cl. B01d *46/10*
U.S. Cl. 55—315 **5 Claims**



A mobile cleaning apparatus is provided for the cleaning of air containing pulverulent material, particularly dust. The apparatus includes a mobile carriage on which is mounted a separation container, a filtration container and suction means for inducing a flow of polluted air through both containers in order to purify it, the separation container being pivotably mounted on the carriage and detachable therefrom to facilitate its emptying. A connection for air flow from the separation container to the filtration container is completed when the separation container is supported in place on the carriage.

3,608,284
GANG MOWER
Leon Paul Erdman, Beaver Dam, Wis., assignor to Deere & Company, Moline, Ill.
Filed Apr. 9, 1970, Ser. No. 26,984
Int. Cl. A01d *75/30*
U.S. Cl. 56—6 **16 Claims**



A gang mower assembly is connected to a lawn and garden tractor having a rotary mower suspended therebeneath and includes a draft frame rigidly connected to the rear of the tractor, a pair of transversely extending draft tubes pivotally connected to the opposite sides

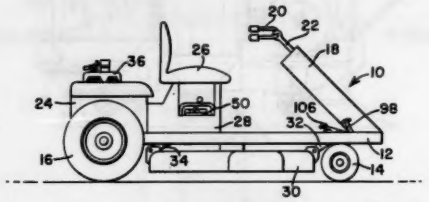
of the draft frame for vertical pivoting movement and a pair of wheeled rotary mower units articulately connected to the draft tubes for vertical pivoting movement about the draft tubes and rocking movement about fore-and-aft extending axes. The mower assemblies are slidable along the draft tubes and power means are provided to move the mower assemblies between extending working positions and retracted transport positions.

3,608,285

NEUTRAL START SYSTEM FOR RIDING MOWERS

Martin Adolph Berk, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Apr. 15, 1970, Ser. No. 28,674
Int. Cl. A01d *35/26*
U.S. Cl. 56—10.2 **5 Claims**



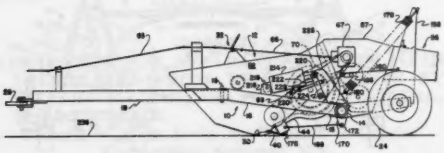
A neutral start electrical system prevents the engine on a riding mower from starting unless the mower is disengaged and the vehicle drive is disengaged. This system is based on a switch in the engine ignition circuit which normally completes the ignition circuit through an auxiliary circuit, but which removes the auxiliary circuit from the ignition circuit when the engine is running. The auxiliary circuit includes first and second addtional switches in series with each other. The first additional switch is responsive to a condition of the clutch for the vehicle drive and is open when the vehicle drive is engaged. The second additional switch is responsive to a condition of the clutch for the mower drive and is open when the mower drive is engaged. The neutral start electrical system provides an open ignition circuit if an attempt is made to start the engine while either the vehicle clutch or mower clutch is engaged to thereby prevent starting of the engine.

3,608,286

MOWER-CONDITIONER FRAME

Henry N. Lausch and Bruce D. Schwalm, Leola, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Continuation-in-part of application Ser. No. 864,062, Oct. 6, 1969. This application Aug. 17, 1970, Ser. No. 64,276
Int. Cl. A01d *41/04*
U.S. Cl. 56—14.4 **8 Claims**



A frame for a mower-conditioner having a reel, cutting means, a consolidating auger, and conditioning rolls.

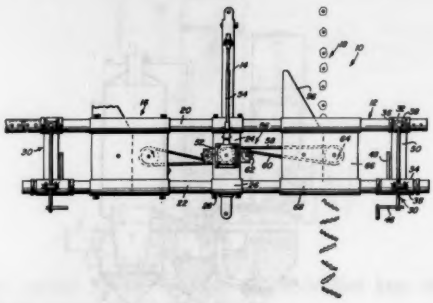
In this frame the main lateral structure is a single member passing beneath the machine in a depression formed by a space between the auger housing and the lower conditioning roll.

3,608,287

COMBINATION CUTTER AND CONDITIONER FOR ROW FORAGE

Glenton G. Gaertner, Rte. 2, Box 78, La Grange, Tex. 78945

Filed May 6, 1969, Ser. No. 822,138
Int. Cl. A01d *41/08*
U.S. Cl. 56—13.7 **8 Claims**



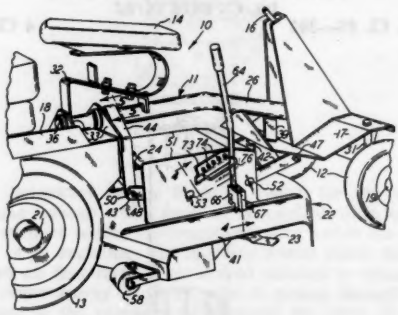
Standing stalks of plants are crushed and cut by vertical roller assemblies on a moving frame to cut and condition crops in one operation. Vertically elongated crimping elements on the rollers intermesh to engage the stalks while cutter blades on the lower ends of the rollers cut the stalks.

3,608,288

TRACTOR WITH A FLOTATIONALLY MOUNTED MOWER

Sherman C. Heth and Vernon R. Kaufman, Racine, Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.

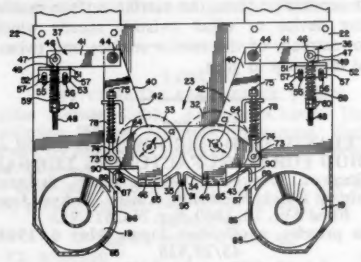
Filed Apr. 23, 1970, Ser. No. 31,223
Int. Cl. A01d *35/26*
U.S. Cl. 56—15.8 **6 Claims**



Tractor with a flotationally mounted mower and with the tractor having a frame piece and a front axle assembly and a rear axle assembly with a traction unit. The front axle and rear axle are pivotal relative to each other and in the plane transverse to the fore-and-aft direction of the tractor, by virtue of the tractor frame piece being pivotal relative to the traction unit and rear axle assembly. A rotary type lawn mower is suspended below the tractor frame piece, and the mower floats so that it can move up and down relative to vertically adjusted positions and relative to irregularities in the ground being traversed by the tractor. Rigid type link members suspend the mower from the frame piece, and a pair of links extends forwardly of the mower for the suspension, and a

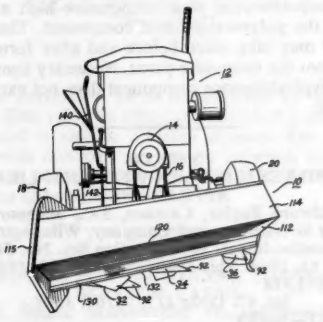
pair of links extends rearwardly of the mower for the suspension. Also, a yoke is affixed to the frame piece and connects to the pair of rearwardly extending link members so that the yoke pivots in the transverse plane along with the pivot of the frame piece and thereby positively positions the mower transverse of the fore-and-aft direction and in response to the mower meeting rises in the ground being traversed. Adjusting mechanism is connected to the mower support links so that the mower can be adjustably raised and lowered in selected set positions. Also, ground engaging wheels are provided on the mower for engaging the ground, depending upon relative height of the mower to the ground.

3,608,289
COTTON HARVESTER
James M. Francis, Bettendorf, Iowa, assignor to International Harvester Company, Chicago, Ill.
Filed May 11, 1970, Ser. No. 36,236
Int. Cl. A01d *45/20*
U.S. Cl. 56—33 **10 Claims**



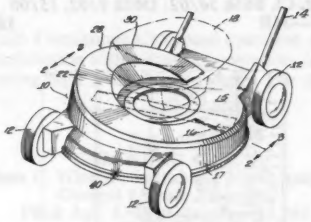
A cotton harvester having a pair of plant stripper rollers, each having adjacent underposed stripper sheets coacting to provide cotton stripping action, each sheet having a surface for doffing and catching repeating cotton and mounted to move in conjunction with its respective stripper roller such that the sheet is yieldably movable relative to that roller to maintain a substantially constant clearance therewith.

3,608,290
WEED AND BRUSH CUTTING APPARATUS
Harry A. Robinson, Elkhart, Ind.
(P.O. Box 321, Avilla, Ind. 46710)
Filed May 16, 1969, Ser. No. 825,364
Int. Cl. A01d *57/26*
U.S. Cl. 56—192 **10 Claims**



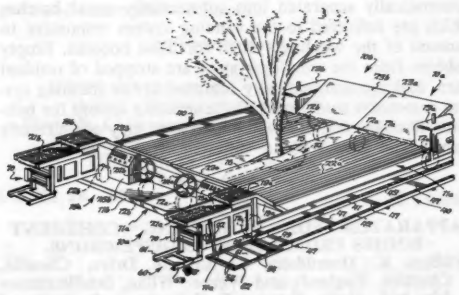
A weed and brush cutting apparatus having one or more horizontally rotatable cutters mounted beneath a supporting body, and an angularly disposed pusher extending forwardly beyond the cutters for pushing the weeds and brush forward prior to the cutting operation. A conveyor means is disposed above and adjacent to the cutter blades for receiving the cut material and moving the material to one side of the apparatus. The apparatus is normally mounted on the front of a tractor or other vehicle which provides the power for driving the weed and brush cutting apparatus.

3,608,291
CHUTELESS ROTARY MOWER HOUSING
Earl H. Kidd, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Jan. 3, 1969, Ser. No. 788,803
Int. Cl. A01d *55/18*
U.S. Cl. 56—320.1 **4 Claims**



A rotary mower housing having a top wall including a cutting and lifting portion, a compressing portion and a mulching portion in circumferential series in the direction of blade rotation. In addition, the housing has a sidewall deflector extending downwardly and outwardly from the housing sidewall.

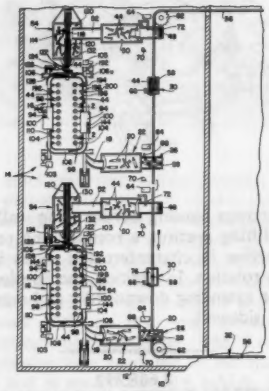
3,608,292
COLLECTION SYSTEM FOR HARVESTING MACHINES
James L. Perry, 4025 Hartland Road, Gasport, N.Y. 14067
Filed Jan. 20, 1970, Ser. No. 4,281
Int. Cl. A01g *19/06*
U.S. Cl. 56—329 **14 Claims**



A crop collection system for harvesting machines of the type having shaker means carried by an ambulatory frame and including conveying means in the frame for receiving removed crops and transporting them to a point of collection relative to the frame. A plurality of crop receiving bins or receptacles are carried with the machine frame by means of a conveyor attached to one side of the fame which moves the bins, one at a time, toward the point of crop collection. A bin carrying means pivotally

mounted on the machine frame and moved by means of an hydraulic cylinder elevates a bin to where the open end thereof is in communication with the point of crop collection and gradually lowers the bin as it is filled. The bins are placed on the carrying means one at a time by a clamping means pivotally connecting to the carrying means and including movable jaws operatively connecting to an hydraulic cylinder. The clamping means is moved toward the conveyor to grip a bin and returned, with the bin, so as to place the bin on the carrying means.

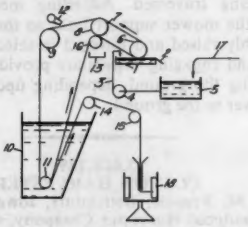
3,608,293
SPINNING AND WINDING SYSTEM
Charles W. Brouwer, East Greenwich, R.I., assignor to Leesona Corporation, Warwick, R.I.
Filed Oct. 21, 1969, Ser. No. 868,041
Int. Cl. B65h *54/02;* **D01h** *9/02, 15/00*
U.S. Cl. 57—34R **18 Claims**



An automatic spinning and winding system for handling different types of bobbins and including a self-tending spinning system for filling empty bobbins with yarn, and a self-tending winding system for winding the yarn from the filled bobbins onto yarn packages. The filled bobbins from the spinning system are stored and are automatically separated into substantially equal batches which are delivered to the winding system responsive to demand of the winding system for filled bobbins. Empty bobbins from the winding system are stripped of residual yarn, and are automatically returned to the spinning system responsive to demand of the spinning system for bobbins. The spinning and winding system may concurrently handle and keep separate different types of bobbins.

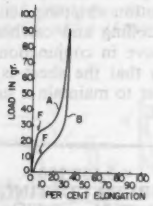
3,608,294
APPARATUS FOR PRODUCING COHERENT BODIES FROM ASBESTOS DISPERSIONS
William K. Donaldson, 23 Cringle Drive, Cheadle, Cheshire, England; and Werner Wilke, Schillerstrasse 34; and Hans Fetzer, Emil-Kostweg 5, both of Schwabisch Hall, Germany
Application Apr. 14, 1969, Ser. No. 839,748, which is a continuation-in-part of application Ser. No. 510,246, Nov. 29, 1965. Divided and this application June 9, 1969, Ser. No. 831,783
Claims priority, application Great Britain, Dec. 4, 1964, 49,445/64; May 7, 1965, 19,469/65; Austria, May 3, 1966, A 4,176/66; Dec. 23, 1966, A 11,853/66
Int. Cl. D02g *3/06, 3/20*
U.S. Cl. 57—35 **5 Claims**

An apparatus for producing asbestos yarn from an aqueous dispersion of asbestos fibers comprises supply means for the dispersion with a dispensing device for shaping the dispersion into a travelling film strip onto the surface of a movable carrier structure. As the surface travels past the outlet of the dispensing device, it entrains the dispersion. Applicator means are provided for covering the surface of the carrier structure with coagulating agent



so that the entrained dispersion coagulates to a film strip material while in contact with the carrier surface. The strip, after separation from the carrier surface reaches a pot-spinning device or other twisting means which is located downstream of the carrier surface and twists the coagulated film strip to yarn.

3,608,295
HIGHLY ELASTICIZED FIBROUS COMPOSITE AND A METHOD FOR MANUFACTURING THE SAME
Tohru Kitazawa, Osaka-shi, Osaka, Japan, assignor to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 28, 1969, Ser. No. 819,913
Claims priority, application Japan, May 6, 1968, 43/29,935
Int. Cl. D02g *3/04, 3/32, 3/36*
U.S. Cl. 57—140BY **30 Claims**

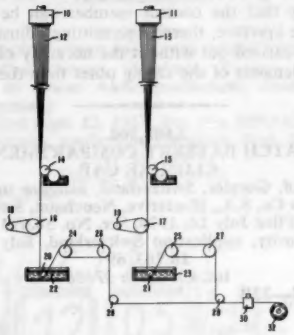


A method for manufacturing a highly elasticized fibrous composite by uniting polypivalolactone components with other componental fibers and thermally treating thus obtained composite yarn at a temperature high enough to elasticize the polypivalolactone component. The thermal treatment may take place before and after formation of fabrics from the composite yarns. Necessary content ratio of the polypivalolactone component does not exceed 25% by weight.

3,608,296
POLYESTER YARN WITH SILK-LIKE APPEARANCE
Robert Edward Taylor, Camden, S.C., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of application Ser. No. 564,905, July 13, 1966. This application Oct. 28, 1969, Ser. No. 871,418
Int. Cl. D02g *1/18, 3/04, 3/24*
U.S. Cl. 57—140BY **4 Claims**

A silk-like appearance is provided in fabric by polyester yarn prepared by melt-spinning bright polymer containing surface-modifying agent through non-round spinneret orifices to produce rough-surfaced filaments of different cross-sections, and drawing the filaments to 0.75–

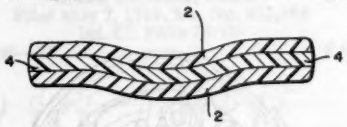
1.50 denier with a part being subjected to conditions different from other filaments to impart differential shrinkability. Alternatively a different polymer composition is used in part of the filaments to impart differential shrinkability.



3,608,297
SYNTHETIC FILAMENT YARN
Malcolm Carnie Cobb, Anthony Charles Davis, and Kazimierz Wiktor Mieszkis, Pontypool, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed May 19, 1969, Ser. No. 826,017
Claims priority, application Great Britain, May 24, 1968, 24,933/68
Int. Cl. D02g *3/04, 3/22*
U.S. Cl. 57—140 **8 Claims**

A yarn comprising a blend of not less than 70% of delustered filaments and not more than 30% of bright filaments wherein the delustred filaments contain not less than 0.7% by weight of a delustrant (TiO_2) and the bright filaments contain less than 0.3% of said delustrant.

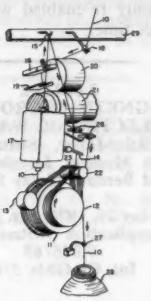
3,608,298
PEARLESCENT YARN
Peter J. Schoots, Nieuwendam, Netherlands, assignor to Lurex N.V., Amsterdam, Netherlands
Filed Mar. 25, 1969, Ser. No. 810,173
Int. Cl. D02g *3/06*
U.S. Cl. 57—140R **8 Claims**



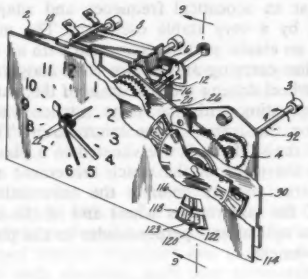
Colored pearlescent yarns are obtained by laminating polyester films using an adhesive containing a pearlescent material and a suitable coloring pigment. The resulting yarns provide non-toxic pearlescent materials which may be based on toxic lead salts and which materials have a high degree of luster.

3,608,299
PROCESS FOR PRODUCING TORQUE STRETCH YARNS
Alfred H. Dugas, Martinsville, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 15, 1970, Ser. No. 28,583
Int. Cl. D02g *3/02*
U.S. Cl. 57—157F **8 Claims**

A process is disclosed for producing uniform torque stretch yarns useful for knitting stretch-apparel, such as ladies' sheer hosiery. Yarn is false-twisted with a fluid-torque jet device and the twist is heat-set in a jet of heated fluid. Continuous high speed operation of the process, in combination with a drawing operation, is illustrated for providing high levels of set-twist in low denier yarn.

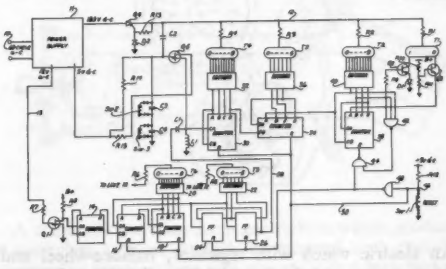


3,608,300
CALENDAR CLOCK
William C. Wingler, Southboro, Mass., assignor to General Electric Company
Filed Apr. 6, 1970, Ser. No. 25,756
Int. Cl. G04b *19/24*
U.S. Cl. 58— **9 Claims**



A calendar clock wherein a day and date mechanism is uniquely constructed and mounted between a front plate and a base plate of a clock.

3,608,301
DIGITAL CLOCK HAVING AUTOMATIC INDICATION OF POWER FAILURE
Harry R. Loewengart, New York, N.Y., assignor to Quasar Microsystems, Inc., Brentwood, N.Y.
Filed Apr. 30, 1970, Ser. No. 33,275
Int. Cl. G04c *3/00*
U.S. Cl. 58—23A **15 Claims**



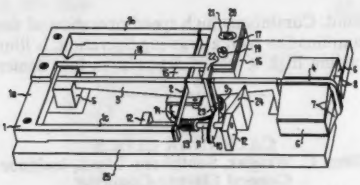
In an electrically operated timepiece means are provided to detect the failure of the electrical power supply,

and to thereupon disable the time indication. That indication remains disabled even after the electrical power is restored, and is only re-enabled when the timepiece is reset to the correct time.

3,608,302
ELECTROMAGNETIC MICROMOTOR FOR AN ELECTRONIC WATCH

Andre Cachin, Saint-Imier, Switzerland, assignor to Compagnie des Montres Longines, Francillon S.A., Saint-Imier, and Bernard Golay S.A., Lausanne Vaud, Switzerland

Filed May 28, 1970, Ser. No. 41,181
Claims priority, application Switzerland, June 13, 1969, 9,045/69
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 **3 Claims**

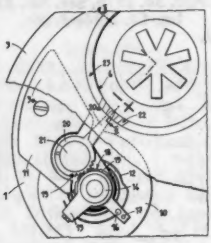


An electromagnetic micromotor for an electronic watch, vibrating at an acoustical frequency and adapted to be controlled by a very stable oscillator. The micromotor comprises an elastic portion connected with an oscillating mass portion carrying an impulse pawl cooperating with a ratchet wheel driving the gear-train of the watch, a stop pawl, cooperating with the same ratchet wheel, being mounted on the frame of the micromotor. The ratchet wheel and the said pawls are situated in a plane perpendicular to the plane of the watch movement and an inclined mirror renders possible the observation of the motion of the said ratchet wheel and of the said pawls through an optical axis perpendicular to the plane of the watch movement.

3,608,303
ELECTRIC WATCH WITH BALANCE-WHEEL AND HAIRSPRING

Jean Schaad, Gorgier, Switzerland, assignor to Voumard Machines Co. S.A., Hauterive, Neuchatel, Switzerland

Filed July 14, 1970, Ser. No. 54,692
Claims priority, application Switzerland, July 15, 1969, 10,764/69
Int. Cl. G04c *3/04*
U.S. Cl. 58—28R **1 Claim**

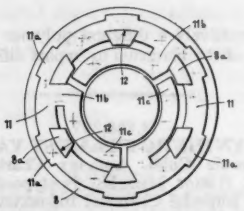


An electric watch with regulator, balance-wheel and hairspring comprising a watch casing having a back in which is provided an aperture covered with a removable cap, in which a source of current can be put in place and removed through the aperture, characterized by a control member for the regulator having its end situated in the immediate neighborhood of the edge of the aperture in such a way that the control member can be reachable through the aperture, thereby permitting adjusting operations to be carried out without the necessity of disassembling the elements of the casing other than the cap.

3,608,304
WATCH BATTERY COMPARTMENT CLOSURE CAP

Jean Schaad, Gorgier, Switzerland, assignor to Voumard Machines Co. S.A., Hauterive, Neuchatel, Switzerland

Filed July 14, 1970, Ser. No. 54,693
Claims priority, application Switzerland, July 15, 1969, 10,763/69
Int. Cl. G04b *37/08*
U.S. Cl. 58—23B **2 Claims**



A cap for closing the battery compartment of an electric watch comprising two sections one comprising the closure disc and the second comprising a bayonet fitting engagement disc.

3,608,305
COORDINATED COMBINED RELEASABLE DAY AND DATE JUMPER MECHANISM FOR CALENDAR TIMEPIECES

Georges Bullat, Fontainemelon, Switzerland, assignor to Fabrique d'Horlogerie de Fontainemelon S.A., Fontainemelon, Switzerland

Filed Mar. 31, 1970, Ser. No. 24,065
Claims priority, application Switzerland, Apr. 28, 1969, 6,398/69
Int. Cl. G04b *19/24*
U.S. Cl. 58—58 **2 Claims**

A calendar timepiece has a toothed day ring and a star wheel carrying means for indicating days of the week, and comprises a first jumper lever urged into engagement with the teeth of the date ring by a jumper spring and a pivotally mounted second jumper. The second jumper has an elastically deformable first arm terminating

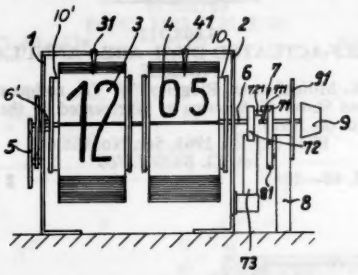
in a jumper beak engaging in the teeth of the star wheel and a second arm kinematically solid with the first jumper lever.

3,608,306

PLANE INDICATOR SETTING ARRANGEMENT

Claus-Christian Cobarg, Steinbach, Taunus, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 22, 1969, Ser. No. 859,643
Claims priority, application Germany, Sept. 23, 1968, P 17 98 304.9
Int. Cl. G04b *19/00*
U.S. Cl. 58—126 9 Claims



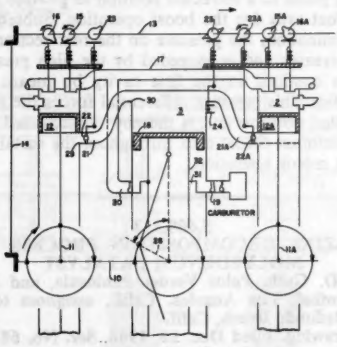
A setting arrangement for plane or leaf indicators used in conjunction with clocks to present a digital display of the time. The leaf or plane indicators are mounted on a drum which is driven from the clock mechanism, through a coupling with coupling pins. The coupling pins are mounted on gears of the coupling. One of the gears is mounted on a shaft to which a setting or adjustment knob is secured. By rotating the knob, it is possible to adjust the instant of contact between the coupling pins, and thereby the engagement of coupling. A scale surrounds the setting knob for realizing accurate settings of the indicator. Setting of the knob may be in the forward or reverse direction, and a blocking mechanism becomes operational when the reverse rotation of the knob exceeds a predetermined limit.

3,608,307

COMPOUND INTERNAL COMBUSTION ENGINE WITH RE-EXPANSION CYLINDER

Edwin J. Strom, R.R. 1, Wellington, British Columbia, Canada

Filed May 7, 1969, Ser. No. 822,554
Int. Cl. F01b *73/00*
U.S. Cl. 60—15 6 Claims



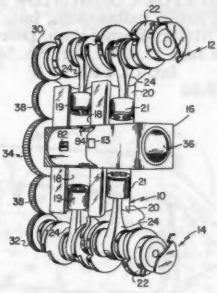
An internal combustion engine which uses partially expanded gases from the power stroke of the internal combustion cylinder to operate a double acting expansion cylinder to provide additional power to the crank shaft using the opposite portion of the expansion cylinder piston as a supercharger and providing timing means to control the flow of gases through communicating ports to obtain the maximum power, two internal combustion cylinders being used with one expansion cylinder to obtain maximum power.

3,608,308

EXTERNAL COMBUSTION CHAMBER ENGINE

Charles C. Cary and John P. Moussouris, Cambridge, Mass., assignors to Moca Systems, Inc., Chelmsford, Mass.

Filed Dec. 11, 1969, Ser. No. 884,076
Int. Cl. F02g *3/00*
U.S. Cl. 60—39.63 24 Claims



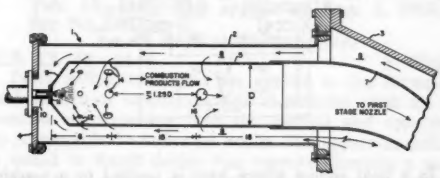
In a motor including two cylinders, a reciprocating piston within each cylinder and porting extending from each cylinder to a valving surface, a rotor having an outer valving surface, an interior chamber, and at least two ducts extending from the chamber and terminating in ports at the rotor valving surface. In one preferred aspect, the interior chamber is a combustion chamber and a fuel line extends from without the rotor to within the chamber. In another preferred aspect, the rotor includes three axially-spaced interior chambers and a pair of ducts extends from each chamber, each duct terminating at the rotor valving surface in a port and the ports of each pair being symmetrically positioned.

3,608,309

LOW SMOKE COMBUSTION SYSTEM

William E. Hill, Scotia, and Milton B. Hilt, Edward P. Hopkins, and Robert H. Johnson, Schenectady, N.Y., assignors to General Electric Company

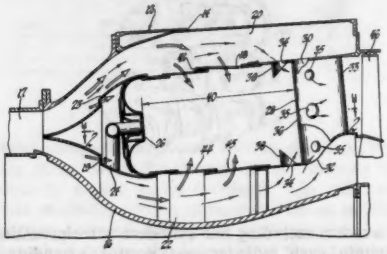
Filed May 21, 1970, Ser. No. 39,332
Int. Cl. F02c *3/24*; F23r *1/10*
U.S. Cl. 60—39.65 4 Claims



A combustion system for a gas turbine which produces a smokeless exhaust stack is constructed such that the combustion reaction zone will operate with a lean fuel-air mixture. The lean combustion zone is stabilized by a vortex generated around the centerline of the liner, creating

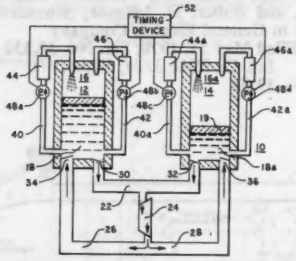
gas flow patterns that cause strong back flow in the combustion reaction zone. This vortical flow also sweeps out the fuel-rich pockets, thus facilitating complete combustion. A thermal soaking region with no air holes in the liner is provided downstream of the last row of combustion air holes having an axial length of at least 1.25D wherein that soot which may be formed in the combustion process is consumed by a very fast chemical reaction. The temperature throughout the soaking region is maintained sufficiently high to induce such a reaction. Axially downstream of this region, tempering air is added to the combustion products such that they are cooled sufficiently in order to enter the first stage nozzle at the desired temperature.

3,608,310
TURBINE STATOR-COMBUSTOR STRUCTURE
John M. Vaught, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed June 27, 1966, Ser. No. 560,658
Int. Cl. F02c *7/12*
U.S. Cl. 60—39.66 **3 Claims**



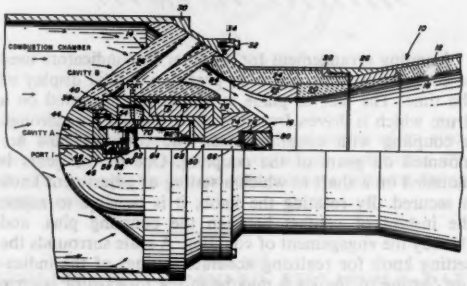
A turbine stator-combustor structure in which the turbine stator vanes are integrated into an annular combustor resulting in a much shorter combination. The stator vanes are convection and film cooled while impingement cooling of the leading edges is also provided.

3,608,311
ENGINE
John F. Roesel, Jr., Rte. 2, Box 281–M, Upper Manatee River Road, Bradenton, Fla. 33505
Filed Apr. 17, 1970, Ser. No. 29,601
Int. Cl. F01d *15/08;* **F04b** *17/00*
U.S. Cl. 60—108 **14 Claims**



In a heat engine where heat is applied to a working fluid contained in a chamber to expand the fluid, removing the heat source while allowing the fluid to expand further, applying cooling while compressing the working fluid and removing the cooling while further compressing the fluid, said fluid during said expansion being applied to utilization means to perform work, the improvement therein comprising: having at least two chambers which contain a liquid and a gas section; hot and cold lines connecting the liquid sections to the gas sections, including pumping means, heating and cooling means in the respective lines; forward and return flow passages communicating between said liquid sections across one-way valves which allow flow into the forward flow passage and out of the return flow passage, and a work area in series between the forward and return passages; and, timer means coupled to said hot and cold lines to sequentially allow hot and cool liquid to flow from liquid to gas sections to cause gas expansion and compression resulting in a flow of liquid out of at least one chamber into said forward passage and/or out of said return passage into at least one chamber across said work area.

3,608,312
SELF-ACTUATED DUAL AREA ANNULAR NOZZLE
Louis E. Miltenberger, Ridgeley, W. Va., assignor to the United States of America as represented by the Secretary of the Navy
Filed Oct. 22, 1969, Ser. No. 868,657
Int. Cl. B63h *11/00*
U.S. Cl. 60—204 **2 Claims**



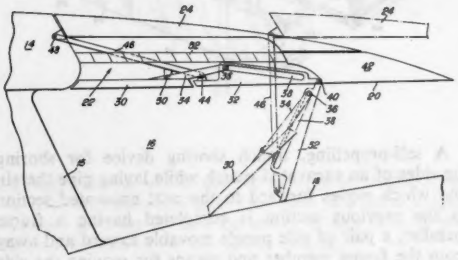
An annular nozzle having a movable pintle and check valve assembly which is self-actuated to change the throat area from a maximum to a minimum and provide dual thrust levels. During boost operation, chamber gases pressurize a first cavity in the front of the pintle and as the boost propellant burns, exhaust gas flows through the annular throat passage of the nozzle and the resulting expanding gas pressure on the rear or supersonic section of the pintle exceeds the pressure in the first cavity and holds the pintle in a retracted position to provide a maximum throat area for the boost operation. Subsequent to boost termination, the pressure on the rear section of the pintle decreases and is exceeded by the high pressure of the gases confined in the first cavity by means of the check valve. This pressure differential forces the pintle to an extended position and is thereby self-actuated to provide a minimum throat area throughout the sustain phase of rocket motor operation.

3,608,313
HYDRAZINE DECOMPOSITION PROCESS USING MOLYBDENUM CATALYST
Eugene D. Guth, Palos Verdes Peninsula, and Jack L. Blumenthal, Los Angeles, Calif., assignors to TRW Inc., Redondo Beach, Calif.
No Drawing. Filed Dec. 16, 1966, Ser. No. 602,115
Int. Cl. C06d *5/04*
U.S. Cl. 60—219 **6 Claims**

This invention relates to a process for the spontaneous catalytic decomposition of rocket propellants containing hydrazine or mixtures of hydrazine and hydrazine nitrate.

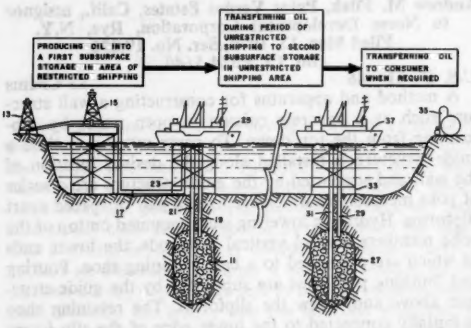
The catalyst used in this invention retains its activity after exposure to the propellant flame environment thereby permitting multiple starts of a rocket engine. The catalyst consists of molybdenum metal coated on a high surface area support body such as alumina. Iron, nickel, copper, iridium, or ruthenium may be included as co-catalyst metals.

3,608,314
THRUST REVERSER
Rowan Herbert Colley, Derby, England, assignor to Rolls-Royce Limited, Derby, England
Filed Aug. 25, 1969, Ser. No. 852,833
Claims priority, application Great Britain, Aug. 30, 1968, 41,554/68
Int. Cl. F02k *1/20, 3/06*
U.S. Cl. 60—226 **11 Claims**



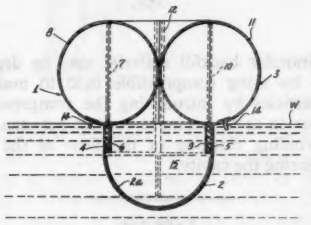
A thrust reverser for a gas turbine engine comprises an annular duct adapted to have gases from the engine pass therethrough and defined by radially inner and radially outer walls, the radially outer wall having a circumferentially extending opening, a plurality of angularly spaced apart flaps movable between a first position in which they close the said opening and a second position in which they extend across and at least partially close the annular duct to the rear of the opening, each flap comprising front and rear flap portions, the front flap portion being folded in front of the rear flap portion in the annular duct when the flaps are in the second position.

3,608,315
METHOD OF PRODUCING OIL IN RESTRICTED SHIPPING AREAS
Robert Wilson, Dallas, Tex., assignor to Atlantic Richfield Company, Philadelphia, Pa.
Filed Nov. 24, 1967, Ser. No. 685,541
Int. Cl. B65g *5/00;* **E21f** *15/00*
U.S. Cl. 61—.5 **22 Claims**


PRODUCING OIL INTO A FIRST SUBSURFACE STORAGE IN AREA OF RESTRICTED SHIPPING
TRANSFERRING OIL DURING PERIOD OF UNRESTRICTED SHIPPING TO SECOND SUBSURFACE STORAGE IN UNRESTRICTED SHIPPING AREA
TRANSFERRING OIL TO CONSUMER WHEN REQUIRED

Two large subsurface storage reservoirs, preferably underwater, are used to assist in producing and transporting crude oil from restricted shipping areas. In one area where shipping is restricted during a major portion of the year, crude oil is produced into a first large subsurface storage facility. During a period when shipping is unrestricted, the oil in the first subsurface storage facility is transferred by water transporting means to a second large subsurface storage facility in an unrestricted shipping area. Thereafter, the oil in the second subsurface storage facility is transferred to the consumer whenever required by the consumer. The subsurface storage reservoirs may be in a chimney created by nuclear explosion.

3,608,316
BUOYANT BARRIER AND METHOD FOR INSTALLING THE SAME
James E. Manuel, Belle Terre, N.Y., assignor to Versatech Corporation, Nesconset, N.Y.
Filed Sept. 15, 1969, Ser. No. 857,792
Int. Cl. E02b *15/04*
U.S. Cl. 61—1F **20 Claims**



A buoyant barrier is provided, as well as a method for installing the same, which makes it possible to establish the barrier to confine an oil spill at a remote location in a relatively short time after the spill has occurred. The barrier structure can be of flexible sheet material and is provided in light weight packaged form, ready for delivery by air, the structure being such that very high rates of deployment onto the surface of a body of water are practical. In its packaged form, the barrier structure is completely free of weights. In deployed form, the weight of the structure is supported by air-inflated buoyancy chambers, and the structure is stabilized by a chamber or chambers filled with water from the body of water on which the structure is deployed.

3,608,317
FORMATION AND BACKFILL OF CAVITIES IN SOIL BY JETTING
Richard E. Landau, 717 Cornwell Ave., West Hempstead, N.Y. 11552
Continuation-in-part of application Ser. No. 616,753, Feb. 13, 1967. This application Aug. 6, 1969, Ser. No. 848,113
Int. Cl. E02b *11/00;* **E02d** *5/34*
U.S. Cl. 61—11 **9 Claims**

Fluid jetting techniques are applied to the formation and backfill of cavities formed in material, with the invention encompassing both the method and apparatus to accomplish the indicated results. The apparatus utilizes a vaned or fluted device that permits directing a sufficiently high velocity fluid stream to be directed into the material to develope the desired cavity, with the fluid and material removed passing as effluent through the path or paths provided by the vanes or flutes. By suitably sizing the vanes or flutes, the effluent velocity can be controlled relative the velocity of the fluid directed into the material. Where external vanes or flutes are utilized, the final shape of the formed cavity can be trimmed to conform to the

dimensions of the vane or flute extremities. Where liquid is used in forming the cavity, such liquid effluent as may result from the cavity forming operation may be at least partly purged from the cavity by introducing additional fluid to displace the fluid within the cavity to the extent

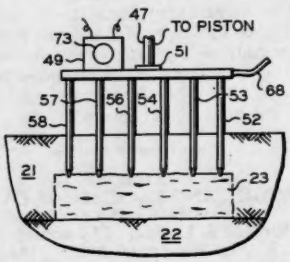
desired. Granular backfill material may be deposited in the cavity by using compressible fluid to maintain the flow of particles by introducing the compressible fluid in a manner so as to minimize contact between particles, thereby avoiding clogging of the flow of the granular backfill entering the cavity.

3,608,318

METHOD AND APPARATUS FOR INJECTING RELATIVELY WATER-IMPERVIOUS DIKES IN RELATIVELY PERMEABLE EARTH FORMATIONS, AND FORMING EARTH-FILLED TANKS AND CANALS THEREWITH

Dale F. Levy and Homer L. Draper, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed May 12, 1969, Ser. No. 823,546
Int. Cl. E02d *3/12*
U.S. Cl. 61—36 **7 Claims**



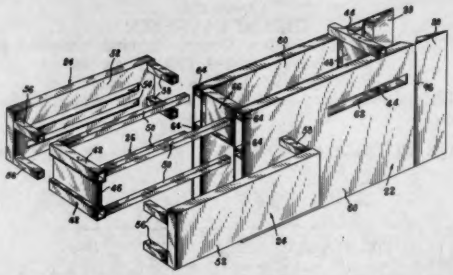
This invention is a process of and apparatus for forming walls, dikes or subterranean tanks or canals in loose unconsolidated soil by inserting a pipe or plurality of pipes into the loose soil and then injecting a liquid comprising molten asphalt or asphalt-water emulsion, or other liquid which will harden into a solid, through the pipe or pipes as they are withdrawn to form walls or dikes in the soil. These walls or dikes can be used to form subterranean tanks or canals. If desired, the liquid can be injected from the pipes through check valves permitting the liquid to emerge but preventing its return to the interior of the pipe. Two forms of apparatus are shown, one injecting through vertical or slanted moving pipes and the other injecting through a rotating semi-circular pipe.

3,608,319

SELF-PROPELLING, TRENCH SHORING DEVICE

Matthew P. Quitadamo, Jr., 81 Grand Ave., Englewood, N.J. 07631

Filed Aug. 25, 1970, Ser. No. 66,829
Int. Cl. E21d *5/00*
U.S. Cl. 61—41A **6 Claims**



A self-propelling, trench shoring device for shoring the sides of an excavated trench while laying pipe therein and which moves forward to the next excavated section as the previous section is completed having a frame member, a pair of side panels movable toward and away from the frame member and means for moving the side panels between a first position when they are close to the frame member and a second position when they are spaced from the frame member and pressure is exerted on the sides of the excavated trench to support the same, a longitudinal member movable between a first position when its longitudinal dimension is substantially coincident with the frame and a second position when it is rearward of the frame, the longitudinal member being moved to the second position while the side panels are in the second position to move the frame to the next excavated section; the side panels being moved to the first position and the longitudinal member being moved forward so that it is in the first position preparatory to moving the side panels to the second position in the next excavated section, the frame being provided at its front with a pair of vertical steering vanes and a lateral steering vane for aiding in the positioning of the device as it moves from section to section.

3,608,320

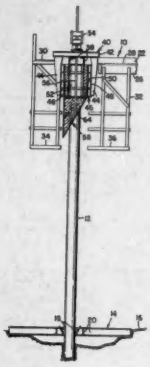
METHOD AND APPARATUS FOR CONSTRUCTING A CONCRETE WALL STRUCTURE IN OPEN WATER

Andrew M. Filak, Palos Verdes Estates, Calif., assignor to Norse Development Corporation, Rye, N.Y.

Filed Mar. 13, 1970, Ser. No. 19,296
Int. Cl. E02d *5/40*
U.S. Cl. 61—46 **13 Claims**

A method and apparatus for constructing a wall structure such as a concrete caisson in open water by slipforming from the top down. To carry out the method a guide structure is installed along the desired location of the wall and supported by the guide structure are a series of yoke members to which are fixed a pair of spaced apart slipforms. Hydraulic lowering jacks mounted on top of the yoke members control vertical jack rods, the lower ends of which are connected to a base retaining shoe. Pouring and finishing platforms are supported by the guide structure above and below the slipforms. The retaining shoe is initially connected to the lower edge of the slip forms and in constructing a caisson, is located just above the highwater line. The first pour fills the retaining shoe and when it has solidified, the jacks lower it evenly below

the slipforms. As pouring and slipforming continues the shoe soon enters the water and the weight on the jacks is reduced by the water displaced. When the retaining shoe reaches the bottom, water may be applied through



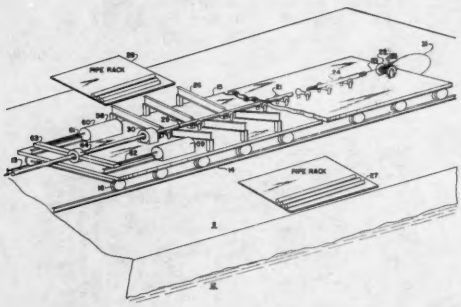
passages formed in the shoe to provide jet outlets along its inner and outer surfaces. The water jets aid in helping the shoe to penetrate into the ocean or lake floor to provide a firm footing for the wall or caisson.

3,608,321

APPARATUS AND METHOD FOR LAYING PIPELINE UNDERWATER

Thomas W. G. Richardson, Jr., and Dean P. Hemphill, Houston, Tex., assignors to Shell Oil Company, New York, N.Y.

Filed Nov. 25, 1968, Ser. No. 779,320
Int. Cl. B63b *35/04*
U.S. Cl. 61—72.3 **13 Claims**



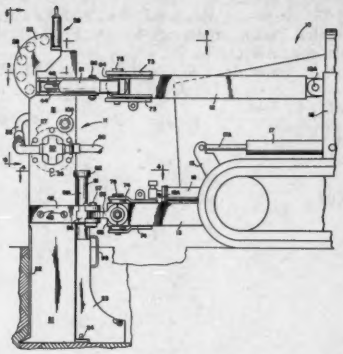
Apparatus and method for laying a pipeline underwater from a floatable platform which is adapted to assemble and lay pipeline therefrom. The platform includes at least one trolley mounted for substantially horizontal movement along the platform. The pipeline is selectively held in a steady state relative to the carriage when the floatable platform is standing. A constant restraining force is applied on the trolley to apply a constant tension on the pipeline during vessel surge and to take up relative movement between the trolley and the floatable platform. A constant tension is maintained on the pipeline when the pipeline is released relative to the trolley as the movable platform is moved to effect paying out of the pipeline.

3,608,322

FRONT MOUNTED CABLE LAYING ASSEMBLY

Frank R. Kinnan and Kenneth G. Bright, Camas Valley, Oreg., assignors to Henkels and McCoy, Inc., Blue Bell, Pa.

Filed July 25, 1969, Ser. No. 846,653
Int. Cl. F16l *1/00;* **E02f** *5/18;* **A01b** *11/00*
U.S. Cl. 61—72.6 **5 Claims**



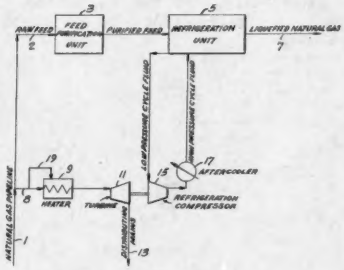
A cable laying assembly is disclosed mounted on the forward end of a prime mover for advancement through the ground to deposit a continuous cable or conduit in a kerf cut by a blade element of the assembly. The blade is detachably carried by parallelogram type linkage. Shock absorbing components isolate the prime mover from vibratory motion of the plow. Steering cylinders move the blade about an upright axis while lifting cylinders vertically position the plow assembly. A vibratory unit is mounted in a laterally offset manner from the blade. Trailing rearwardly of the blade is a cable shoe structure of a design permitting easy removal of a continuous cable from the cable shoe and ultimately from the entire cable plow assembly.

3,608,323

NATURAL GAS LIQUEFACTION PROCESS

Claude Salama, Montreal, Quebec, Canada, assignor to Canadian Liquid Air Ltd.-Air Liquide Canada LTEE, Montreal, Quebec, Canada

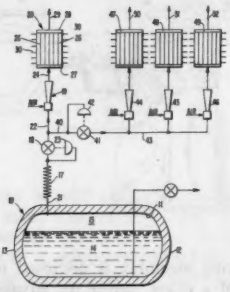
Filed Nov. 20, 1967, Ser. No. 684,369
Claims priority, application Canada, Jan. 31, 1967, 981,719
Int. Cl. F25j *1/00*
U.S. Cl. 62—9 **6 Claims**



The invention relates to a process and apparatus for liquefying natural gas. The gas stream from a main distribution line is divided into two streams. One stream

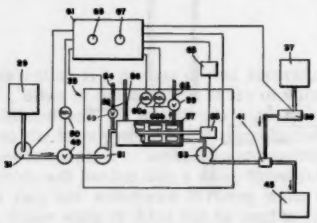
is heated, then expanded through an expansion turbine to be distributed at a lower pressure. The power from the expansion turbine is used to operate a refrigeration system which liquefies the other gas stream.

3,608,324
METHOD AND APPARATUS FOR STORING NORMALLY GASEOUS HAZARDOUS MATERIAL IN LIQUID PHASE
Alan H. Singleton, Emmaus, Pa., and Edward G. Biskis, Omaha, Nebr., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed June 4, 1969, Ser. No. 830,397
Int. Cl. F17c *13/00*
U.S. Cl. 62—48 11 Claims



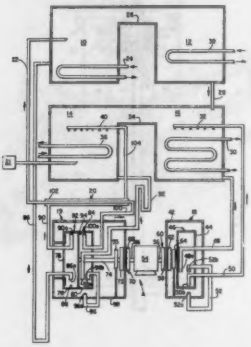
Method and apparatus for safe venting of vapors of normally gaseous hazardous material stored in liquid phase in an insulated container under low pressure and temperature. Hazardous vapor is withdrawn from the container at times when the internal container pressure exceeds a predetermined value and fed to a zone containing a catalyst to oxidize the vapor to a harmless gas which is vented to the atmosphere. In the event the container insulation fails causing rapid vaporization of stored liquid, a large quantity of hazardous vapor is withdrawn when the internal container pressure exceeds a higher predetermined value and fed to a catalytic zone of greater capacity which may include a plurality of catalytic units. The invention is disclosed in the environment of liquefied carbon monoxide and hazardous vapors thereof being oxidized catalytically to harmless carbon dioxide.

3,608,325
METHOD AND APPARATUS FOR STOPPING ICE CREAM FREEZERS
Walter L. Hock, Skokie, Ill., assignor to Kraftco Corporation, New York, N.Y.
Filed Sept. 8, 1969, Ser. No. 855,985
Int. Cl. A23g *5/00*
U.S. Cl. 62—70 6 Claims



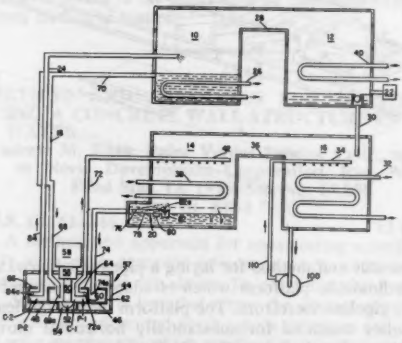
A method and apparatus are provided to simultaneously shut down various pieces of equipment in the freezing section of an ice cream manufacturing line and to sequentially shut down other pieces of equipment after a predetermined time has elapsed.

3,608,326
ABSORPTION REFRIGERATION SYSTEM
Louis H. Leonard, Jr., De Witt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 18, 1970, Ser. No. 20,775
Int. Cl. F25b *15/06*
U.S. Cl. 62—101 5 Claims



An absorption refrigeration system employing in combination a flash-type solution heat exchanger and a sensible-type solution heat exchanger, the flash-type heat exchanger incorporating therein a plurality of scoop pumps providing relatively high velocity forced flow of both strong and weak absorbent solution to and from the generator, to provide good solution heat transfer efficiencies within the system. The strong and weak solutions are pumped in counterflow relation through a sensible-type heat exchanger communicating with the flash-type heat exchanger. The sensible-type heat exchanger may be located interiorly or exteriorly of the flash-type heat exchanger.

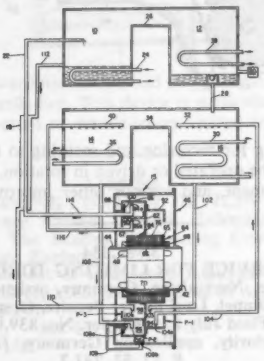
3,608,327
ABSORPTION REFRIGERATION SYSTEM
Louis H. Leonard, Jr., De Witt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 18, 1970, Ser. No. 20,774
Int. Cl. F25b *15/06*
U.S. Cl. 62—141 5 Claims



An absorption refrigeration system wherein there is provided fluid transfer apparatus preferably taking the form of a stationary housing mounting therein a plurality of pump means desirably of the scoop type for circulating absorbent solution through the system. The pump means communicates with the absorber and has in association therewith fluid flow control means located in the absorber and responsive to changes in the liquid level and density

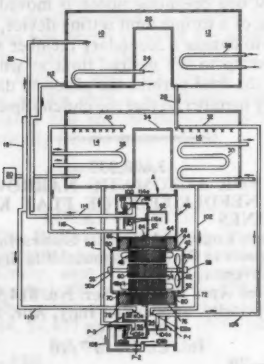
in the absorber to vary the volume of solution flowing to the pump, thereby controlling the volume of solution transferred to the generator for reconcentration under varying machine conditions.

3,608,328
ABSORPTION REFRIGERATION SYSTEM
Vance A. Osborne, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 18, 1970, Ser. No. 20,767
Int. Cl. F25b *15/06;* H02k *7/00*
U.S. Cl. 62—476 **1 Claim**



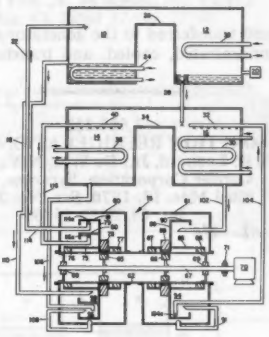
An absorption refrigeration system wherein there is provided fluid transfer apparatus having a stationary hermetic nonferromagnetic housing encasing rotor means to which is connected for rotation in unison therewith pump means for circulating absorbent solution through the system, the rotor means being supported in magnetically inductive relation with a stator located exteriorly of the hermetic housing. The laminations of the rotor means have embedded therein a plurality of circumferentially spaced carbon conductor rods cast or pressed in integral relation with carbon shorting rings at the opposite ends thereof which also function as bearing means for the rotor.

3,608,329
ABSORPTION REFRIGERATION SYSTEM
William W. Bell, Jr., Marcellus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 18, 1970, Ser. No. 20,768
Int. Cl. F25b *15/06*
U.S. Cl. 62—476 **6 Claims**



An absorption refrigeration system wherein there is provided fluid transfer apparatus comprising a stationary hermetic housing having a cylindrical nonferromagnetic wall encasing annular rotor means within the housing about which a rotatable scoop pump pan is connected for rotation therewith for circulating absorbent solution through the system. The rotor is supported in magnetically inductive relation through the nonferromagnetic housing wall with an annular stator located exteriorly of the hermetic housing. A second rotor is provided within the cylindrical stator for driving a fan for cooling the stator. The scoop pump includes sections for pumping strong solution to the absorber, weak solution to the generator, and refrigerant to the evaporator.

3,608,330
ABSORPTION REFRIGERATION SYSTEM
Louis H. Leonard, Jr., De Witt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 18, 1970, Ser. No. 20,770
Int. Cl. F25b *15/06*
U.S. Cl. 62—476 **3 Claims**

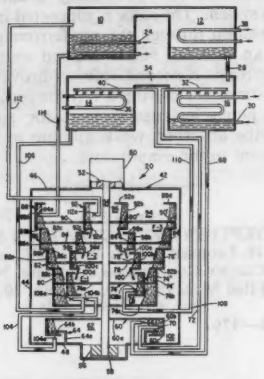


An absorption refrigeration system having a generator, a condenser, an evaporator, an absorber, and a fluid transfer apparatus for pumping liquids in the system. The fluid transfer apparatus includes a plurality of spaced housings sealingly secured to the exterior surface of a cylindrical nonferromagnetic wall. One or more scoop pump pans are rotatably mounted within each of the housings for rotation about the nonferromagnetic wall. An annular magnetic coupling member is secured to the rotor member within each housing. A second annular magnetic coupling member is mounted exteriorly of each housing in coupling relation with the annular magnet therein and is attached to an external electric motor to drive the scoop pump pans within the housings.

3,608,331
ABSORPTION REFRIGERATION SYSTEM
Louis H. Leonard, Jr., De Witt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 18, 1970, Ser. No. 20,776
Int. Cl. F25b *15/06*
U.S. Cl. 62—476 **7 Claims**

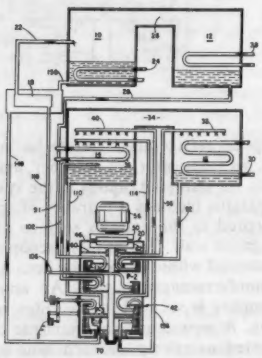
An absorption refrigeration system wherein there is provided in communication with the absorber and generator, fluid conditioning apparatus in the form of a hermetic housing supporting therein a plurality of rotatable flash chambers, one of which receives relatively cool weak absorbent solution from the absorber, and another of the chambers having directed thereto relatively hot strong absorbent solution from the generator, the two solutions being centrifugally impelled outwardly so as to transfer the solutions through the apparatus by

means of scoop pumps, the strong solution being successively flash cooled and the resulting flash vapors absorbed by the weak solution, whereby the weak solution is heated,



diluted, and transferred to the generator and strong solution is concentrated, cooled, and transferred to the absorber.

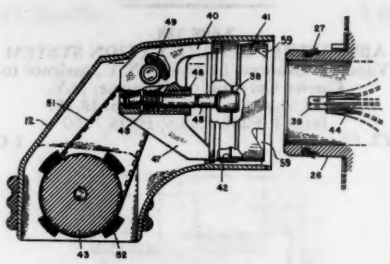
3,608,332
ABSORPTION REFRIGERATION SYSTEM
Louis H. Leonard, Jr., De Witt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 18, 1970, Ser. No. 20,777
Int. Cl. F25b *15/06*
U.S. Cl. 62—476 **5 Claims**



An absorption refrigeration system wherein there is provided in communication with the evaporator, absorber, generator and condenser fluid handling apparatus in the form of a hermetic housing mounting therein a rotatively driven shaft member journaled at opposite ends in bearing means and supporting a plurality of scoop pumps for effecting, among other functions, circulation of refrigerant and absorbent solution through the system, purging, and machine capacity control.

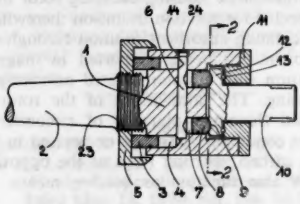
3,608,333
VACUUM CLEANER AND POWER UNIT
Wilbur-Webb Selley, Maitland, and Richard H. Schaffer, Orlando, Fla., assignors to Bison Manufacturing Company, Inc., Orlando, Fla.
Filed June 20, 1968, Ser. No. 738,595
Int. Cl. F16d *1/00*
U.S. Cl. 64—4 **2 Claims**

A power unit usable as the principal ingredient of a vacuum cleaner, or as a means for driving certain accessories in rotation, employing an electric motor as the source of rotation. Our power unit possesses a number of novel features, including an improved brush driving means, a



resilient ring for receiving and securing to the unit, components to be operated or driven in rotation, a power take-off arrangement, and various other improvements.

3,608,334
DEVICE FOR LIMITING TORQUE
Karl Zinner, Nuremberg, Germany, assignor to Richard Glimpel, Lauf an der Pegnitz, Germany
Filed July 8, 1969, Ser. No. 839,901
Claims priority, application Germany, July 9, 1968, P 17 52 741.2
Int. Cl. F16d *7/00, 43/20*
U.S. Cl. 64—29 **11 Claims**

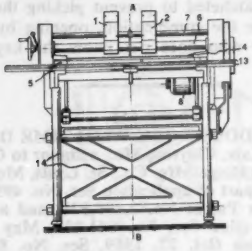


Thread-cutting devices, machine tools and torque wrenches require a torque limiting device to avoid the danger of overload; this invention relates to a fluid operated clutch mechanism, wherein the fluid has a compressible component such as air in a mixture with a hydraulic fluid. At least one operating piston is moved by the fluid, by movement of a torque limit setting device, either radially or axially to engage a secondary member so that torque is transmitted up to the desired limit at which point the resilience of the fluid permits the piston to disengage from the secondary member so that the clutch slips.

3,608,335
DEVICE FOR AUTOMATIC NARROWING ON BOTH NEEDLE-BEDS OF FLAT KNITTING MACHINES
Berardi Ercole, Lugo, and Versetti Giancarlo, Caravaggio, Italy, assignors to Societa responsabilita limitata Fimma, Faenza, Ravenna, Italy
Filed Apr. 10, 1969, Ser. No. 814,944
Claims priority, application Italy, Apr. 12, 1968, 31,051/68
Int. Cl. D04b *7/10*
U.S. Cl. 66—70 **4 Claims**

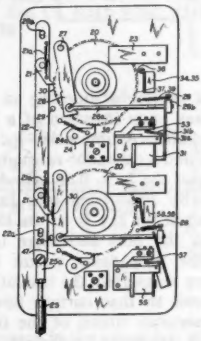
A device for automatic narrowing on both needle-beds of flat knitting machines which consists in reducing in number of the knitting needles by selectively operating

the forward needles. The needles slide up and down in their grooves by pushing their butts in the appropriate direction. During the operation, only the transfer needles



are on the forward needle-bed and only normal needles are on the rear needle-bed. This device is particularly adapted to the manufacture of double-jersey knitted fabric.

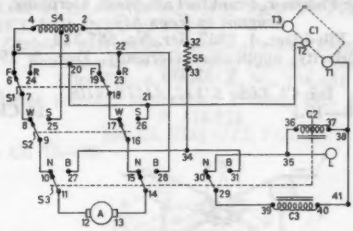
3,608,336
TIMING CONTROL DEVICES
Raymond Henry Phillips, Birstall, Leicester, England, assignor to The Bentley Engineering Company Limited, Leicester, England
Continuation-in-part of abandoned application Ser. No. 432,987, Feb. 16, 1965. This application Apr. 10, 1969, Ser. No. 815,141
Int. Cl. D04b *15/00*
U.S. Cl. 66—155 **5 Claims**



A timing control device suitable for arresting over continuously adjustable periods, the racking of a control chain of a knitting machine wherein one or more rack wheels each with a setting dial and associated racking means and bluffing means is adapted to control by cam projections and micro switches the bluffing and freeing of racking means for the control chain or like control member. Each of said rack wheels is adjustable as to its starting setting over a continuous range indicated on the associated dial and its bluffing means is released electromagnetically from a main control.

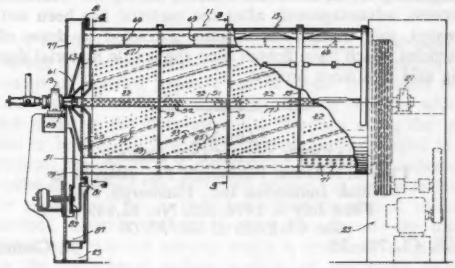
3,608,337
LOCKING DEVICE
Robert Neville Redfearn and Harry Dawson Watkin, Huyton, Liverpool, England, assignors to Fisher-Bendix Limited, Kirkby, near Liverpool, Lancashire, England
Filed Oct. 28, 1969, Ser. No. 871,892
Claims priority, application Great Britain, Oct. 31, 1968, 51,696/68, 51,697/68; Feb. 26, 1969, 10,363/69
Int. Cl. D06f *37/42*
U.S. Cl. 68—12R **9 Claims**

An electrically driven apparatus housed in a cabinet or casing with a door has an electrically operated door latch which is held locked by the voltage developed by the motor during braking of the apparatus. A regenerative braking resistor is provided, in laundry equipment this



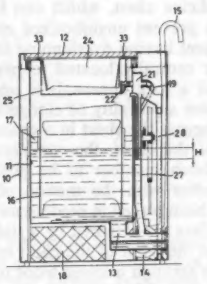
may be the water heating element. Various switching arrangements are described.

3,608,338
WASHING MACHINE
William C. Lutzen, Wauwatosa, Wis., assignor to Ludell Mfg. Co., Milwaukee, Wis.
Filed Feb. 26, 1970, Ser. No. 14,452
Int. Cl. D06f *37/06, 37/08*
U.S. Cl. 68—145 **6 Claims**



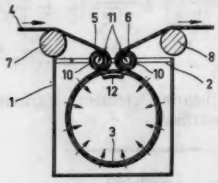
Disclosed herein is a washing machine comprising an outer shell together with an inner liner and skew members located between the liner and the outer shell whereby to effect both axial and circumferential circulation of fluids in a laundry-free area and elsewhere within the shell in response to shell rotation.

3,608,339
ANTIFOAM SEAL FOR WASHING MACHINES
Lamberto Mazza, Pordenone, Italy, assignor to Industrie A. Zanussi S.p.A., Pordenone, Italy
Filed July 11, 1969, Ser. No. 841,095
Claims priority, application Italy, Oct. 2, 1968, 21,979/68
Int. Cl. D06f *39/08*
U.S. Cl. 68—208 **2 Claims**



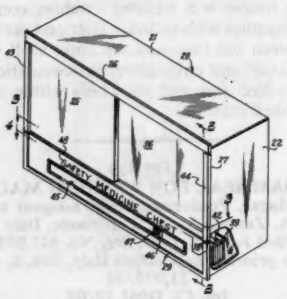
A washing machine in which any foam tending to overflow from the washing tub is conveyed through conduit means such as to pass the foam through a water body in which it dissolves.

3,608,340
APPARATUS FOR THE WET-TREATMENT OF LIQUID-PERMEABLE MATERIALS
Heinz Fleissner, Frankfurt am Main, Germany, assignor to Vepa AG
Filed Dec. 1, 1967, Ser. No. 687,320
Claims priority, application Germany, Dec. 3, 1966, V 32,473
Int. Cl. B05c *3/132, 3/178, 8/04*
U.S. Cl. 68—19.1 **16 Claims**



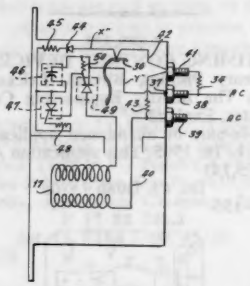
The present disclosure relates an apparatus for the wet-treatment, preferably for washing and impregnating liquid-permeable materials which can be stressed in the lengthwise direction. More particularly, the present disclosure is directed to an apparatus for washing and impregnating textile materials wherein during the treatment process, advantageously after the material has been wet-treated, said material is vacuum extracted to draw off particles which have floated onto the textile material during said treatment process.

3,608,341
SAFETY MEDICINE CHEST
Charles S. Galtz, Pittsburgh, Pa., assignor to Namir Industries, Inc., Pittsburgh, Pa.
Filed July 6, 1970, Ser. No. 52,649
Int. Cl. F05b *65/08, 37/00*
U.S. Cl. 70—95 **12 Claims**



A safety medicine chest, which can be made entirely from plastic, to prevent unauthorized entry by children, including a cabinet having overlapping sliding doors with a latch member centrally located to prevent opening of either door until a lock apparatus is operated. The lock apparatus includes a plurality of elongated tumbler members extending across the chest in a chamber at the lower front portion of the chest, the tumblers being designed to permit the latch member to be pushed downwardly and out of conflict with the motion of the doors only when they have been placed in predetermined relative locations. The tumblers are actuated by a slide member which is operable from the front of the chest by a slide member which protrudes through a lower front panel on the chest and is linearly movable across the front of the chest. The slide protrudes through an elongated slot above which words are imprinted or embossed. The permutation for properly locating the tumblers is arrived at by spelling a word, moving the slide sequentially to various letters in the legend adjacent the slot. The final position locates the slide member itself adjacent the latch carrying member without moving a tumbler, the slide constituting the final tumbler. Portions of the device which move relative to each other are ratcheted to prevent picking the lock. By using a word for the combination, opening by one who cannot spell, or who does not know the key word, is prevented.

3,608,342
ELECTRIC DOOR LOCK WITH TIME DELAY
Jonathon H. Katz, Clayton, Mo., assignor to C. Hager & Sons Hinge Mfg. Co., St. Louis, Mo.
Continuation-in-part of application Ser. No. 499,674, Oct. 21, 1965, now Patent No. 3,408,838, and a continuation of application Ser. No. 641,309, May 25, 1967. This application Oct. 27, 1969, Ser. No. 869,944
Int. Cl. E05b *39/04, 49/02*
U.S. Cl. 70—271 **26 Claims**



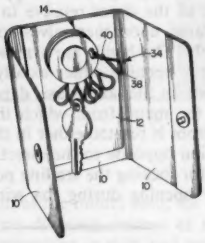
An electric lock device for opening an electrically releasable latch means upon insertion of a key into a key slot in the lock cylinder. A time delay including a silicon controlled rectifier and a capacitor-resistance series is used to prevent picking of the lock. The cylinder arrangement comprises electrically conducting pins having insulative bands such that when no key is in the lock, a circuit is completed through the pins and there is not sufficient current through the time delay circuit to activate the latch. When the key is inserted, the insulative bands interrupt the lock circuit so that current flows through the SCR, capacitor-resistance circuit of the time delay, thus when the SCR is triggered, sufficient current passes through the latch to open the latch.

A modification provides a variable time delay and utilizes resistors connected in parallel combinations by different location of the pins. Different keys disconnect different pins and thus cause different time delays to occur before the charge on the capacitor triggers the SCR and opens the latch. This time delay depends on the number of resistors connected into the circuit by the insertion of a particular key. A second SCR is used in the circuit to form a pulsating output. This circuit is termed a relaxation oscillator. A circuit is also used to identify different keys by use of an identification circuit including Wheatstone bridge circuits, having resistors proportional in value as those used in the lock cylinder assembly, to control a neon readout device.

3,608,343
KEY RETAINER
Yoel Y. Kimel, 249 Upland Road, Newtonville, Mass. 02160
Filed June 22, 1970, Ser. No. 48,049
Int. Cl. A47g *29/10*
U.S. Cl. 70—456R **9 Claims**

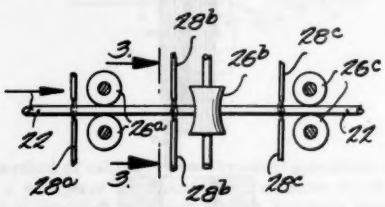
A key retainer having a circular hub with a peripheral sidewall. The sidewall includes one or more slots which

receive and retain one or more key hooks. The sidewall and slots are arranged so that the key hooks may be positioned at any location about the periphery of the hub in carousel fashion. The hooks may be attached and



detached by simple manipulation of the hooks through a specially formed slot in the hub. In one embodiment of the device, the hooks are slideable along and within an annular slot in the sidewall. In another embodiment of the device, the sidewall itself is rotatable about the hub.

3,608,344
PROCESS FOR HOT WORKING OF COPPER
Paul R. Schwan, South Bend, Ind., assignor to Van Straaten Chemical Company, Chicago, Ill.
Filed May 14, 1969, Ser. No. 824,550
Int. Cl. B21b *9/00, 45/02*
U.S. Cl. 72—38 **5 Claims**

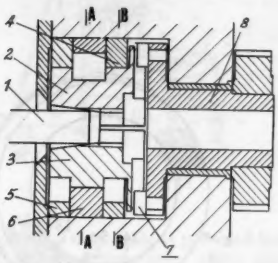


This improvement in the art of hot working copper and copper alloys in the presence of an oxygen-containing environment to minimize or eliminate the problems associated with oxide formation on the surface thereof at elevated temperatures comprises contacting the stock substantially continuously during the hot working thereof with an aqueous solution containing ammonium chloride.

3,608,345
PROCESS FOR IMPACT EXTRUSION OF ALUMINUM ALLOYS
Henri Bouchereau, Clermont-Ferrand, and Marc Anagnostidis, Chamalieres, France, assignors to Societe Metallurgique de Gerzat, Paris, France
No Drawing. Filed Nov. 1, 1967, Ser. No. 679,627
Claims priority, application France, Nov. 15, 1966, 83,570
Int. Cl. B21c *23/20, 23/24, 23/30, 23/32, 23/18*
U.S. Cl. 72—47 **6 Claims**

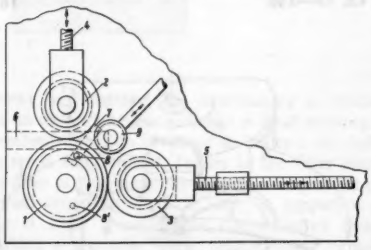
A process for the inverse wire drawing by shock of aluminum alloys without the adherence of particles of metal on the stamped member by precoating the surfaces of the bloom coming in contact with the stamped member with zinc whereby the operation can be carried out substantially continuously without the formations of striations, cracks or gouges in the surfaces contacted by the stamp.

3,608,346
METHOD OF PRODUCING METAL OBJECTS HAVING ROTATIONAL SMOOTH OR TOOTHED SURFACES, AND DEVICE FOR PUTTING THE METHOD INTO EFFECT
Zdzislaw Marciniak, Warsaw, Poland, assignor to Politechnika Warszawska, Warsaw, Poland
Filed Feb. 4, 1969, Ser. No. 796,451
Claims priority, application Poland, Feb. 6, 1968, P 118,921
Int. Cl. B21j *5/12, 7/16*
U.S. Cl. 72—76 **4 Claims**



A method and apparatus for producing metal objects having a rotational surface of a specific configuration by means of exerting pressure on the object in at least two radial directions by tools having shaping surfaces which are rolled in the circumferential direction along the object to be treated. The objects are plastically shaped in a cyclical manner with a plurality of successively repeated cycles to produce the individual segment of rotary surface or segment of inner toothing whose theoretical rolling surface, together with its prolongation beyond the tool, forms a cylindrical surface which is internally tangential to the cylindrical rolling surface of the tooth being worked. For each successive phase of each cycle, the object being worked is axially shifted by a feed quantity within the time when the object is out of contact with the tools.

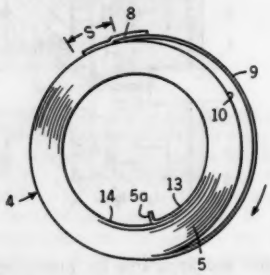
3,608,347
PROCESS AND APPARATUS FOR MANUFACTURING RINGS
Werner Kemminer, Ahle, near Bunde, Germany
Filed Sept. 17, 1968, Ser. No. 760,190
Int. Cl. B21f *3/04*
U.S. Cl. 72—142 **5 Claims**



A process and apparatus for producing continuously a spiral, cylindrical package by winding a flat iron band. The diameter of the formed cylindrical package corresponds substantially to the exterior diameter of the formed spiral rings. The flat iron band is wound around a circular support while being guided by circular rotatable means upwardly around the circular support. These circular rotatable guiding means bear against the flat iron band in

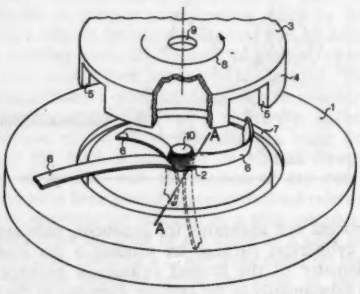
the area where the band begins its run around the circular support in a tangential direction and in an area on the circular support removed approximately 90° therefrom.

3,608,348
WOUND MAGNETIC CORE AND METHOD OF FORMING SAME
John B. McKee, Glendale, Mo., assignor to Wagner Electric Corporation, Newark, N.Y.
Filed July 7, 1969, Ser. No. 839,300
Int. Cl. B21c *47/02*
U.S. Cl. 72—146 **12 Claims**



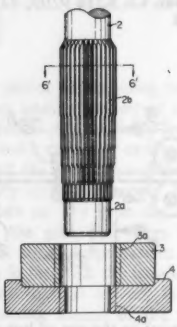
A wound core having a plurality of turns of magnetic strip material with a predetermined amount of looseness between the superposed turns, and at least one space between adjacent superposed turns having a degree of looseness predeterminately greater than that between the other turns. The superposed turns of said wound core are rotated in one direction to obtain the predetermined looseness and then rotated in the other direction to redistribute a portion of said looseness into a desired section of the core.

3,608,349
METHOD AND APPARATUS FOR WINDING SPIRAL SPRINGS
Rudolf Greiner, Allmengasse 41A, CH–4900, Langenthal, Switzerland, and Walter Schweizer and Lothar Kiesewetter, Berlin, Germany; said Schweizer and Kiesewetter assignors to said Greiner
Filed Dec. 18, 1969, Ser. No. 886,203
Claims priority, application Switzerland, Jan. 27, 1969, 1,171/69
Int. Cl. B21d *11/06, 11/10;* **B21f** *3/08*
U.S. Cl. 72—146 **16 Claims**



Method and apparatus for winding a spiral spring assembly from a plurality of lengths of spring metal bands, characterized that the band lengths are supplied through an opening contained in a base plate, each of the bands being twisted or bent about an inclined axis toward an edgewise-supported position normal to the winding face of the base plate. The leading portion of the band is then guided through an axial slit in a winding drum arranged concentrically about the supply opening, so that upon rotation of the drum relative to the base plate, the bands are wound upon themselves to form a convolute spring assembly. The bands are symmetrically discharged from the supply opening either axially or in a uniformly skewed manner. In the latter case, depending on the characteristics of the metal from which the spring bands are formed, the drum is rotated either in the direction of skew or in a direction opposite to the direction of skew. Means are provided for locking the trailing portions of the bands in the supply opening during the winding operation.

3,608,350
APPARATUS AND METHOD FOR PRODUCING BLANKS FOR COMMUTATORS FOR MINIATURE ELECTRIC DEVICES
Terumoto Yamaguchi, 10f 55 Ikeura, Ikeura-cho, Ango-shi, Aichi-ken, Japan
Continuation-in-part of application Ser. No. 575,778, Aug. 29, 1966. This application Mar. 4, 1969, Ser. No. 804,104
Int. Cl. H01r *43/02*
U.S. Cl. 72—358 **3 Claims**

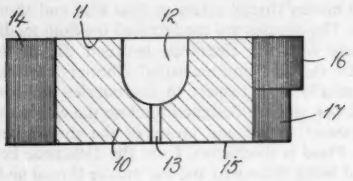


The present method and apparatus is for producing commutator blanks for miniature electric devices wherein a tube blank made of materials having good electrical conductivity is fed into a die having a number of grooves corresponding to the number of bridge pieces of the commutator and pressed by means of a punch provided with a number of teeth similar to that of the commutator bars or segments whose adjoining bars or segments are connected together by bridge pieces.

3,608,351
REINFORCED MOULD AND METHOD AND APPARATUS FOR REINFORCING SAID MOULD
Per-Olof Strandell, Bockstigen 3, Nasbypark, Sweden
Filed Feb. 5, 1969, Ser. No. 796,852
Claims priority, application Sweden, Feb. 7, 1968, 1,619/68
Int. Cl. B21c *3/00*
U.S. Cl. 72—467 **7 Claims**

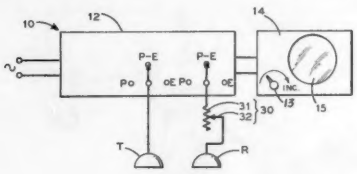
There is provided a mould which has been reinforced by means of a novel method and apparatus. The mould reinforcement comprises at least one winding of thin strip-like material of only some few tenths of a millimetre thick, and in which the whole of the bottom face of each

successive turn of a winding of strip material is in abutment with the upper face of the preceding turn of said winding. In the case of moulds subjected to loads which



vary along the length of the mould core, the novel method and apparatus permit differing degrees of reinforcement pre-tensioning corresponding to said load variations along the mould core.

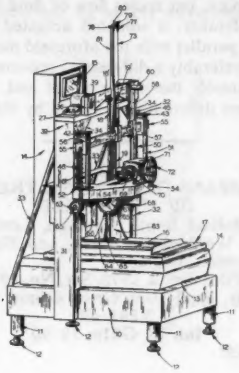
3,608,352
ULTRASONIC TRANSDUCERS
Glenn A. Walton, Wadsworth, and Gilbert R. Forrer, Barberton, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.
Filed Dec. 4, 1968, Ser. No. 780,955
Int. Cl. G01n 29/04
U.S. Cl. 73—1R **2 Claims**



A method of calibrating an ultrasonic transducer to inspect a workpiece for flaws. The transducer to be calibrated is mounted on a metal block having a reference such as a cavity from which ultrasonic waves may be reflected. The transducer is energized to transmit a wave into the block and a reference signal obtained due to the wave being reflected from the obstacle. A second transducer is then mounted on the block and a signal obtained due to a wave being received by the second transducer. Both transducers are then mounted on the workpiece to be inspected and a signal is again obtained due to the wave being received by the second transducer. A comparison is made between the signals due to waves received by the second transducer to adjust the reference signal for inspecting the workpiece.

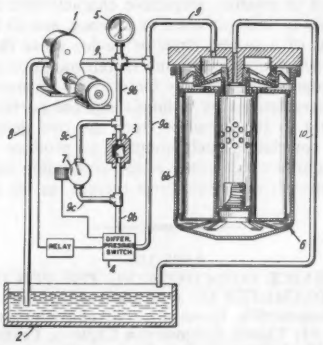
3,608,353
TESTING AND CHECKING DEVICES FOR FORCE MEASURING INSTRUMENTS
Kenneth R. Larson, Des Plaines, Ill., assignor to Snap-On Tools Corporation, Kenosha, Wis.
Filed Nov. 27, 1967, Ser. No. 685,883
Int. Cl. G01l 25/00
U.S. Cl. 73—1C **4 Claims**

Calibrating apparatus for torque wrenches and other force measuring instruments. A framework supports a means for mounting a torque wrench alternately for either clockwise and counterclockwise application of force. A force is transmitted to the torque wrench handle through a gear reduction unit and a sprocket and chain transmission elements. The torque transmitted to the wrench is transmitted through additional linkage to a platform scale for comparison with the torque wrench



reading. In addition a steel cable is provided between the force applying and measuring units which can be used for a variety of testing purposes.

3,608,354
APPARATUS AND METHOD FOR DETERMINING A STRUCTURAL FAILURE
Albert J. Taylor, Plainfield, and Vernon M. Tull, deceased, late of Edison, N.J., by Gladys R. Tull, executrix, assignors to Purolator, Inc., Rahway, N.J.
Filed Jan. 7, 1970, Ser. No. 1,210
Int. Cl. G01m 3/26
U.S. Cl. 73—37 **10 Claims**



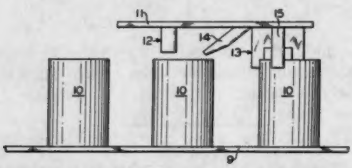
Apparatus and method for determining a structural failure in an object wherein a change in fluid pressure in a pre-determined direction is sensed to indicate the failure. In a preferred embodiment, failure in the filter element of a fluid filter is determined by sensing a drop in the pressure of fluid flowed through the filter. A support is provided for a filter element and contaminated fluid is pumped from a reservoir to the filter element by means of a pump through a supply conduit. A drain conduit returns fluid from the filter to the reservoir. The pressure of the fluid before entering the filter is indicated on a suitable pressure gauge. A drop in pressure in the supply conduit is sensed by a differential pressure sensing device, having opposite sides connected to the supply conduit near the filter element support. One side of the sensing device is connected directly by a conduit to the supply conduit, while the other side is connected to the supply

conduit by means of a second conduit which has unidirectional flow means interposed in the conduit. The latter means permits the free flow of fluid in a direction towards the sensing device, but resists flow of fluid in the opposite direction. Preferably, a solenoid actuated by-pass valve is provided in parallel with the aforesaid means. The sensing device is preferably a differential pressure switch which electrically controls the pump motor and solenoid valve when a pressure differential is sensed by the switch.

3,608,355
FLUIDIC MEANS FOR SENSING THE POSITION OF AN ARTICLE

Christopher Roland Booth Harrison, London, England, assignor to Westinghouse Brake and Signal Company Limited, London, England

Filed Jan. 2, 1970, Ser. No. 207
Claims priority, application Great Britain, Jan. 22, 1969, 3,501/69
Int. Cl. G01m *19/00*
U.S. Cl. 73—37 **4 Claims**

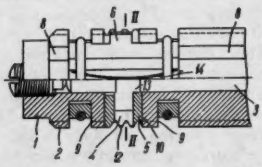


Fluidic detector apparatus for sensing the presence or absence of an object or article, such as a lid on a container, by conveying a succession of containers along a prescribed course in which air jet detector devices having air jet streams emitting therefrom are so positioned as to have the jet streams from one of the detector devices sense the presence or absence of a lid on each of the containers and to produce respective characteristic impulses responsively to such presence or absence, and to have the jet streams of a second detector device sense the movement of each container passing therethrough to also produce an impulse responsively thereto, the apparatus being further characterized by a fluidic control portion acting responsively to the impulses from the two detector devices for correlating such impulses to produce a single control impulse which either effects continuing movement of the conveyor or a shut-down thereof, as the situation demands.

3,608,356
DEVICE FOR CHECKING THE PITCH DIAMETER OF A SCREW THREAD

Max Solomonovich Rozovsky, Novobasmannaya ulitsa 14, kv. 32; Valeria Grigorievna Lapteva, Fryazevskaya ulitsa 32, korpus 3, kv. 9; and Oleg Prokofievich Fedosov, Novorgozhskaya ulitsa 5, kv. 93, all of Moscow, U.S.S.R.

Filed Mar. 24, 1970, Ser. No. 22,323
Int. Cl. G01b *13/12, 13/00*
U.S. Cl. 73—37.9 **1 Claim**

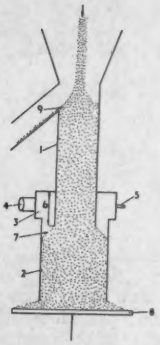


A device for checking the simple pitch effective diameter of internal and external threads measures a parameter of a fluid medium in the clearance between a thread being measured and a master thread. Included in the device is a holder with a master thread which matches and mates with the thread being measured. The holder has passages for the fluid medium and nozzles are arranged diametrically opposite each other on the flanks of a number of adjacent master thread ridges so that they end short of ridge crests. The nozzles are used to feed the fluid medium under pressure into the clearance between the master thread and the thread being measured. Shutters capable of moving radially with respect to the nozzles are contained in the device and are designed to close the clearance between the master thread and crests of the thread being measured. Fluid is discharged from the clearance between the thread being measured and the master thread and a parameter of the fluid which depends upon the amount of clearance between the flanks of the thread being measured and those of the master thread is measured.

3,608,357
MEASURING THE PERMEABILITY OF GRANULAR MATERIAL

Henry Gilbert Meunier, Liege, Belgium, assignor to Centre National de Recherches Metallurgiques, Brussels, Belgium

Filed Mar. 23, 1970, Ser. No. 21,818
Claims priority, application Belgium, Mar. 27, 1969, 730,607
Int. Cl. G01n *15/08*
U.S. Cl. 73—38 **8 Claims**



In measuring permeability of a granular material a first substantially vertical conduit discharges into a second substantially vertical conduit of greater cross-section. An overflow outlet maintains a constant head in the first conduit and the rate of flow of granular material from the second conduit is controlled. The first and second conduits are connected fluid-tightly by a chamber into which a fluid, such as air, is blown.

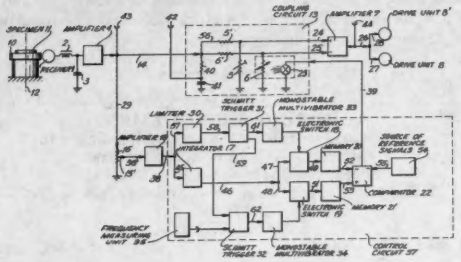
3,608,358
TESTING APPARATUS FOR DETERMINING THE MASS INERTIA MOMENT OF A SPECIMEN

Paul Holdinghausen, Bickenbach, Karl Homilius, Nieder-Ramstadt, and Peter-Uwe Schlechter, Darmstadt, Germany, assignors to Carl Schenck Maschinenfabrik GmbH, Darmstadt, Germany

Filed May 6, 1969, Ser. No. 822,156
Claims priority, application Germany, Aug. 10, 1968, P 17 98 041.5
Int. Cl. G01m *1/12;* **G01n** *3/22*
U.S. Cl. 73—65 **7 Claims**

A receiver in operative proximity with a support rotatably supporting a specimen produces an output signal proportional to the angular velocity of the support and

specimen. A signal proportional to the output signal is supplied to a drive for the support to apply to the support a torque corresponding to the angular velocity of the support and specimen. A control circuit connected between the receiver and the drive maintains the angle of oscillation of the support and specimen.

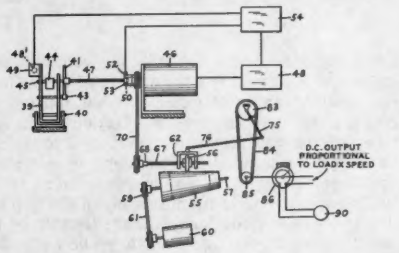


3,608,359

MASS MEASURING SYSTEM

John L. Christmann, Passaic, N.J., assignor to Merrick Scale Mfg. Company, Passaic, N.J.

Filed Nov. 12, 1969, Ser. No. 875,621
Int. Cl. G01g *11/04*; G01h *13/00*
U.S. Cl. 73—67.2 11 Claims



A continuously weighing conveyor is described in which a ninety degree phase angle lag is created between the resonant natural vibrating frequency of a conveyed material weight per foot called hereafter load and the frequency of a motor driven eccentric inducing the vibration and deviation of said phase angle from ninety degrees is detected by a phase sensitive network which automatically adjusts the motor speed for resonance. The speed of the motor is converted into a nonuniform linear motion and said nonuniform linear motion is transformed into rotary motion proportional to the load which actuates a potentiometer. The product of the load and the load conveyor speed representing the weight per time unit conveyed by the weighing conveyor is obtained by extending the voltage of a tachometer generator driven by the load conveyor across the potentiometer winding.

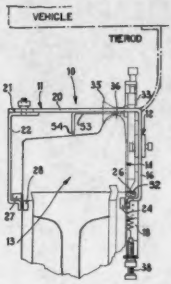
3,608,360

METHOD AND MEANS FOR CHECKING WHEEL SET TIRES IN ROLLING STOCK

Giuseppe Pettinato, 3 Via Campo d'Arrigo, Florence, Italy

Filed Dec. 3, 1968, Ser. No. 780,825
Claims priority, application Italy, Dec. 7, 1967, 23,653/67
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.5 9 Claims

A method and means for checking wheel tires mounted on railway vehicles by means of supersonic waves, said method and means consisting of slidingly connecting a checking probe with the wheel tire and scanning the tire body during a slow rotational movement of the wheel, while the probe is kept stationary. Said scanning operation can be performed by slowly advancing the railway vehicle while the probe is secured thereto or to a small carriage following said railway vehicle. Further, the probe comprises a transducer element which position can be suitably adjusted in respect of the checked tire surface.

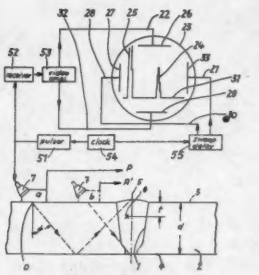


3,608,361

ULTRASONIC PULSE ECHO FLAW DETECTOR EMPLOYING A SPATIAL SCALE ARRANGEMENT ON THE SCREEN OF AN OSCILLOSCOPE

Joseph Krautkramer and Herbert Krautkramer, both of Luxemburger Str. 449, Cologne, Germany

Filed Oct. 11, 1968, Ser. No. 766,796
Claims priority, application Germany, Oct. 31, 1967, K 59,326
Int. Cl. G01n *24/04*
U.S. Cl. 73—67.7 3 Claims



An ultrasonic method of determining flaw size and location is disclosed. In the method a graph arrangement is located in front of the screen of an oscilloscope of a pulse echo ultrasonic testing apparatus. By use of the graph the location and equivalent flaw size of a defective spot in a welding seam or other specimen is determined.

3,608,362

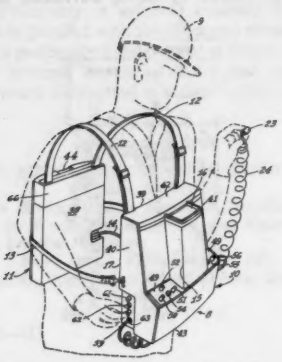
PORTABLE ELECTRONIC EQUIPMENT

George J. Chakar, Danbury, Conn., and Frederick L. Eberle, Hammond, and Bernard Ostrofsky, Gary, Ind.; said Chakar assignor to Automation Industries, Inc., Century City, Los Angeles, Calif.; said Eberle and Ostrofsky assignors to Standard Oil Company, Chicago, Ill.

Filed Apr. 3, 1969, Ser. No. 813,185
Int. Cl. G01n *24/00*
U.S. Cl. 73—67.8 5 Claims

A portable cathode ray oscilloscope type of equipment having a back pack containing a power supply and a chest

pack containing operating controls and the display screen conveniently presented to the bearer for viewing and operation. The two packs are connected by shoulder straps



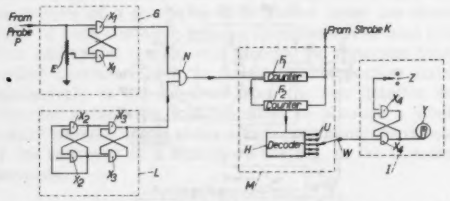
for carrying. The oscilloscope is mounted with the screen facing downward, and is viewed through a light shield and double reflecting means.

3,608,363

METHOD OF DETECTING THE PRESENCE OF FLAWS IN TUBES BY USING ULTRASONIC PULSES, AND APPARATUS FOR USE IN CARRYING OUT THE METHOD

Keith R. Whittington, Great Shelford, England, assignor to T. I. (Group Services) Limited, Birmingham, England

Filed Jan. 31, 1969, Ser. No. 795,580
Claims priority, application Great Britain, Feb. 2, 1968, 5,437/68
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.9 **20 Claims**



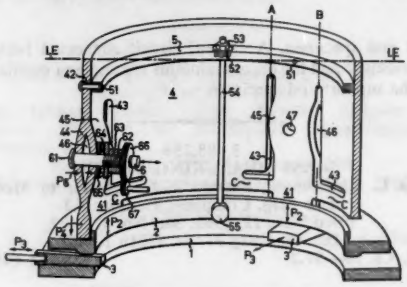
A method of detecting the presence of flaws in tubes by using ultrasonic pulses, and apparatus for carrying out the method. The ultrasonic pulses are emitted by an ultrasonic probe which also picks up the reflected ultrasonic pulses resulting from each transmitted pulse, the reflected ultrasonic pulses creating electrical signals in the probe. The invention makes use of the fact that at any reasonable amplitude level, the total width of the electrical pulse signals corresponding to the ultrasonic pulses reflected from the surfaces of a tube, remains substantially constant irrespective of the thickness of the tube or the contours of its surface. The presence or absence of a flaw at a test point in the tube may therefore be determined by measuring the total width of all electrical pulse signals occurring within a time interval which is sufficient to include the electrical pulse signals caused by the first reflected ultrasonic pulses of a single initial ultrasonic pulse from the inner and outer surfaces of the tube. If this width is greater than the said constant total width of electrical pulse signals due to surface reflections alone, then it is presumed that a flaw is present in the tube at that test point on the tube. The width of each electrical pulse signal is measured digitally by using it to gate a clock waveform and to count the resulting clock pulses. Clock pulses only pass to the counting unit when the amplitude of an electrical pulse signal is above a predetermined amplitude or trigger level which can be set so that only the larger flaws are detected. The time interval over which clock pulses are counted is controlled by a strobe signal.

3,608,364

ADJUSTING ARRANGEMENT

Karl Baur, Neuenburg, Switzerland, assignor to Contraves AG, Zurich, Switzerland

Filed July 3, 1968, Ser. No. 742,372
Claims priority, application Switzerland, July 6, 1967, 9,574/67
Int. Cl. G05d *3/00*
U.S. Cl. 73—88 **8 Claims**



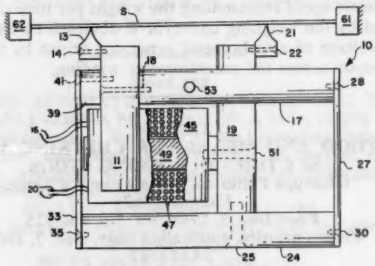
An adjusting device for effecting precision length adjustments. A stressable structural member has two spaced end sections an intermediate section integral with the end sections and split in the direction from one to the other of the end sections so that it is provided with a center gap of substantially lenticular cross-sectional configuration. A stressing arrangement serves to compress the intermediate section transversely of this gap to varying degrees, whereby the longitudinal extension of the member increases as the intermediate section is progressively compressed and decreases as the intermediate section is progressively relieved of compressive stress transversely of the gap.

3,608,365

EXTENSOMETER FRAME

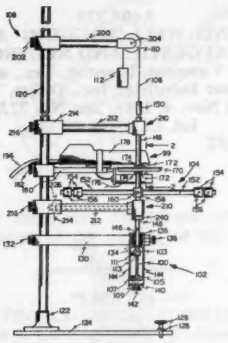
Robert M. Baucom, Hampton, and George J. Heimerl, Yorktown, Va., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 23, 1969, Ser. No. 887,699
Int. Cl. G01b *7/24*
U.S. Cl. 73—88.5R **2 Claims**



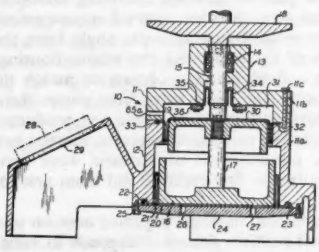
A transducer frame for accommodating a displacement transformer for continuous monitoring of extension of a specimen sample.

3,608,366
TORSION PENDULUM
Noboru Tokita, Wayne, and Randolph Scott, Paterson, N.J., assignors to Uniroyal, Inc., New York, N.Y.
Filed Aug. 25, 1969, Ser. No. 852,804
Int. Cl. G01n 3/32
U.S. Cl. 73—99 7 Claims



Torsion pendulum test apparatus in which a sample of material under test is used as the restoring element in an angular oscillation system. In contrast to earlier devices of this type, a counterbalance weight is employed to eliminate completely all vertical forces upon the sample; an angularly oscillating optical wedge and photoelectric system is used for sensing the amplitude of oscillation, and air bearings are used for stabilization. The device gives very accurate readings for determining dynamic mechanical properties and phase transition temperatures.

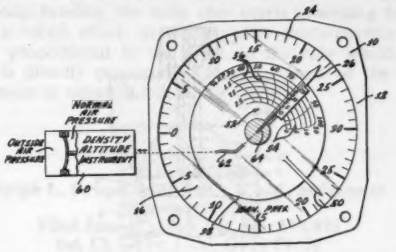
3,608,367
SOIL CONSOLIDATION APPARATUS
Reuben H. Karol, 261 S. Adelaide Ave., Highland Park, N.J. 08924
Filed Dec. 26, 1968, Ser. No. 786,914
Int. Cl. G01n 3/08
U.S. Cl. 73—94 4 Claims



An apparatus employing a plurality of single-convolution diaphragms for accurately testing the consolidation of soil samples or the like. The diaphragms facilitate the use of selective net forces on the samples through diaphragm force differentials, or the incremental, integration of diaphragm forces in order to give accurate specimen loading.

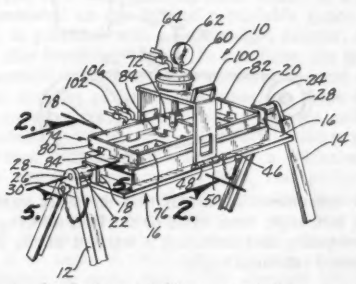
3,608,368
INSTRUMENT FOR INDICATING HORSEPOWER OUTPUT OF AN ENGINE
Ernest N. Cuff, 451 Cedar Crest Ave., Claremont, Calif. 91711
Filed June 16, 1969, Ser. No. 833,379
Int. Cl. G01m 15/00
U.S. Cl. 73—117.3 4 Claims

The invention is an instrument for indicating horsepower output of an engine particularly an aircraft engine in response to speed of the engine, manifold intake pressure and density altitude. The instrument is of a dial



type with an indicating pointer which moves over a graduated chart scale on the dial so that percentage horsepower can be read directly.

3,608,369
ENGINE HEAD TEST STAND
Herbert O. Wilkinson, 614 E. 2nd, Ankeny, Iowa 50021
Filed Nov. 6, 1969, Ser. No. 874,442
Int. Cl. G01m 3/06
U.S. Cl. 73—119R 8 Claims

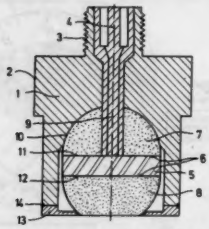


A support selectively rotatably connected to a ground engaging leg structure and having a pressure actuated hold-down means carried thereon for engaging the top side of an engine head. Upstanding sealing elements are provided on the support for sealing openings in the engine head while a liquid conduit is carried on the hold-down for sealingly engaging the inlet opening of the engine head when the pressure means is actuated. A pair of legs extend upwardly on opposite sides of the hold-down rectangular shaped frame and one leg is adapted to be locked to the support while a cross piece is connected to the opposite end of the leg for being pivotally connected to the other leg to permit the pressure means carried on the cross piece to be pivoted away from the top of the support to permit access onto and off of the support. An adapter plate may be placed on the support to selectively seal the bottom side of other engine heads.

3,608,370
MEASUREMENT TRANSDUCER
Kurt Vollenweider, Winterthur, and Hans C. Sonderegger, Neftenbach, Switzerland, assignors to Kistler Instruments AG, Winterthur, Switzerland
Filed Mar. 25, 1969, Ser. No. 810,253
Claims priority, application Switzerland, Mar. 25, 1968, 4,491/68
Int. Cl. G01l 1/16
U.S. Cl. 73—141R 8 Claims

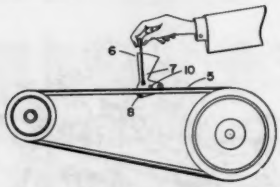
The measuring transducer for measuring physical properties such as force, pressure and acceleration employs a spherically shaped force transmitting member disposed adjacent to the measuring element supported within the

transducer housing. A ring-shaped diaphragm is provided to force bias the member and to permit rocking move-



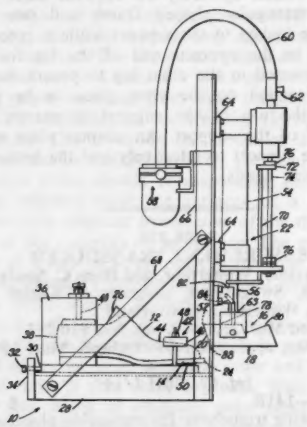
ment thereof in a direction depending upon the relative position of the bearing surface of the pressure transmitting member and the measuring element.

3,608,371
APPARATUS TO DETERMINE TENSION IN A FLEXIBLE STRAND
David L. Kessler, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.
Filed May 28, 1968, Ser. No. 732,595
Int. Cl. G01l *5/06*
U.S. Cl. 73—144 **6 Claims**



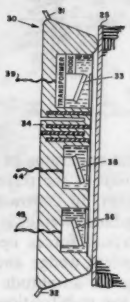
A tensiometer apparatus that measures strand tension of a belt, rope, wire, cable or the like, utilizing a method of torqueing and deflecting a segment of the strand to a standard reference angle.

3,608,372
TESTERS FOR SHOES
Emerson B. Hovey, Wayland, and David O. White, Lexington, Mass., assignors to USM Corporation, Flemington, N.J.
Filed May 15, 1970, Ser. No. 37,513
Int. Cl. G01n *3/36*
U.S. Cl. 73—150 **5 Claims**



A dynamic tester for determining resistance to cell-tearing separation of a resilient cellular elastomer outsole and a shoe upper at the toe portion of a shoe including a shoe holding device and a device for flexing edge extension portions of the outsole at the toe portion repeatedly in a direction to create separative stress.

3,608,373
METHOD AND WELL LOGGING APPARATUS HAVING ACOUSTIC AND NEUTRON PADS
Arthur H. Youmans, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Nov. 4, 1968, Ser. No. 772,894
Int. Cl. E21b *49/00*
U.S. Cl. 73—152 **6 Claims**



A well logging instrument adapted for traversing an earth borehole has a neutron pad member on one side of the instrument which is normally spring-forced into contact with the borehole wall during such a traversal. The instrument has on its opposite side an acoutic pad which is also normally spring-forced into contact with the borehole wall during such a traversal.

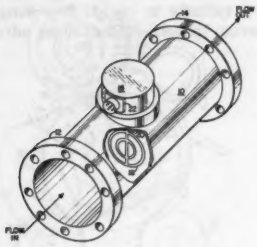
The acoustic pad has an acoustic transmitting transducer and a pair of acoustic receiving transducers for producing an acoustic time interval measurement. Each transducer is mounted on an acute angle from the longitudinal axis of the elongated instrument housing and is mounted in a fluid medium chosen to match the acute angle so that a steep rising wave front passes through the formation surrounding the borehole and produces a steep rising signal at the respective receivers, thereby permitting an accurate measurement of acoustic wave travel time from transmitter to first receiver and from first to second receiver.

The neutron pad, having a capsuled neutron source and an epithermal neutron detector, responds to variations in formation porosity and to the thickness and constituency of mud and mud cake intervening between the pad and the formation. The acoustic pad serves to indicate the extent of the effect on the neutron-derived porosity measurement due to the mud and mud cake and permits a corrected porosity to be derived and recorded.

3,608,374
MASS FLOWMETER
Charles E. Miller, Boulder, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 18, 1969, Ser. No. 808,135
Int. Cl. G01f *1/00*
U.S. Cl. 73—194B **16 Claims**

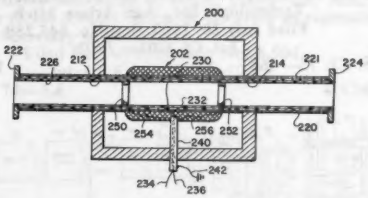
A flowmeter having an impact plate means, such as a vane, which is mounted in a fluid flow and oscillated.

The vane is subject to a torque produced by the drag of the flow in the vane and the mass flow rate of the fluid



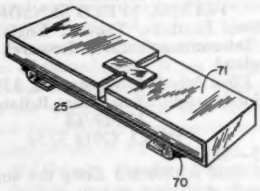
is inferred by measuring the torque or its effect on various parameters of the motion of the vane.

3,608,375
ELECTROMAGNETIC FLOWMETER
Vincent J. Cushing, 9804 Hillridge Drive, Kensington, Md. 20795
Filed Nov. 5, 1968, Ser. No. 773,386
Int. Cl. G01f *1/00;* **H01f** *15/02*
U.S. Cl. 73—194EM **1 Claim**



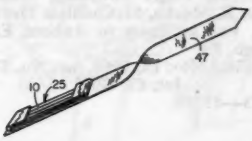
A tubular flow conduit includes a pair of detecting electrodes adjacent thereto, one of said electrodes being a high impedance electrode and another of said electrodes being a low impedance electrode. An electromagnet means is provided of unique construction for producing an alternating magnetic flux which is of substantially the same phase throughout a substantial region of the flowmeter so that the circuit loops within the flowmeter and including the high impedance electrode are threaded by susbtantially no magnetic flux which is coherent and phase-shifted relative to the magnetic flux which generates the flow signal in fluid flowing through the tubular means.

3,608,376
XERITRON
Ralph L. Fenner, Mill Valley, Calif., assignor to Hygrometrix, Inc.
Filed June 17, 1969, Ser. No. 834,092
Int. Cl. G01n *19/10, 27/00*
U.S. Cl. 73—336.5 **10 Claims**



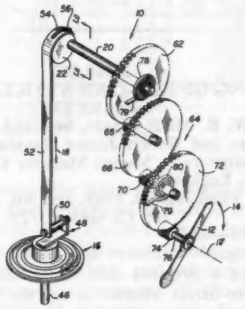
A humidity sensitive element or chip to which an electrical strain gauge, or more specifically, a "pixie" transducer, is attached. While the chip is in the fully saturated state, it is mounted on the back of the pixie strain gauge as by soldering the ends thereto. While the strain gauge will resist bending, the xeric chip exerts a bending force upon it which effects its piezoresistive characteristics directly proportional to the force on the chip which, in turn, is directly proportional to the dryness of the environment in which the device is placed.

3,608,377
XEROMETER
Ralph L. Fenner, Mill Valley, Calif., assignor to Hygrometrix, Inc.
Filed June 17, 1969, Ser. No. 834,093
Int. Cl. G01w *1/00;* **G01n** *19/10*
U.S. Cl. 73—337.5 **9 Claims**



A humidity sensing device called a xerometer, having a rib of a seed-throwing arm which forms the extension of a seed pod of a seed-throwing plant affixed to a suitable pin mounted on the face of a readable gauge and preferably is provided with a light-weight pointer, such as one of thin beryllium copper. In this form, the gauge markings extend through an angle of about one and one-third turns and the gauge face assumes the shape of a spiral. A preferred form of xerometer, however, utilizes a "chip" which comprises a resilient metal saddle, preferably formed of beryllium copper of a thickness of about one one-thousandth of an inch, and preferably carrying three of the spines rigidly connected thereto at their ends. When the vegetable fibers are dry, their warp force bends the metal plate to form an arc, the ends of which lie at an angle of about 60° with respect to each other. It should be noted that as the elements dry they exert a constant warp force upon the metal member, which causes it to bend in equal increments directly proportional to the relative humidity of the environment from the 100% humidity of the straight form to zero humidity.

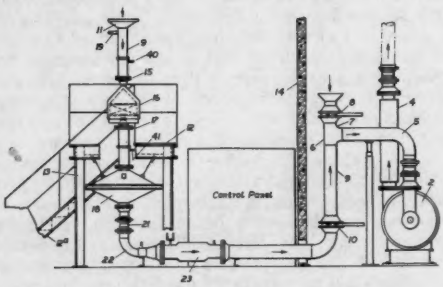
3,608,378
PRESSURE RESPONSIVE INSTRUMENT
Edward Sowinski, % Instrument Craftsmen Corp., 41 Merritt Road, Farmingdale, N.Y. 11735
Filed Nov. 18, 1969, Ser. No. 877,683
Int. Cl. G01l *7/14, 19/04*
U.S. Cl. 73—393 **4 Claims**



An instrument responsive to ambient pressure changes in which a visual indication, such as a pointer, is urged

through standardized rotational traverses for a particular pressure change, even though that pressure change might cause varying linear movements in a sensing diaphragm or bellows being used to operate the pointer. Included in the drive between the bellows and pointer is a rotatable driven member having a least a portion thereof which converts, as a function of its mounting, each linear movement input, even though of a varying nature, into rotational traverses of the same extent. Thus, the instrument is calibrated to the peculiarities in the expansion and contraction performance of the bellows.

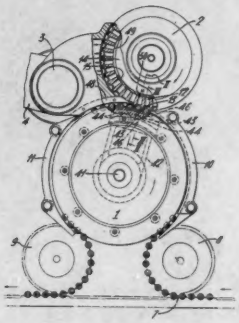
3,608,379
AIR FILTER TESTING APPARATUS
Robert Brevko, Peters Township, Washington County, and John R. Mucka, McCandless Township, Allegheny County, Pa., assignors to Auburn Engineering, Inc., Pittsburgh, Pa.
Filed Nov. 14, 1968, Ser. No. 775,621
Int. Cl. G01f *15/00*
U.S. Cl. 73—432PS **10 Claims**



An improvement in air filter testing apparatus in which a measured amount of dust is drawn into a test filter at a controlled rate of the dust-laden air into the test filter is disclosed. Dust is drawn by an aspirator through a nozzle from an annular trough rotated at a predetermined speed and supplied to air flowing into the test filter. Air from the test filter is then drawn through an absolute filter. At the end of the test, the weight of dust on the air filter is compared to the weight of dust on the absolute filter and measured against the known weight of dust supplied to the apparatus to determine the performance of the air filter. Variable manual and automatic controls provide required programming and protection of the system against overload.

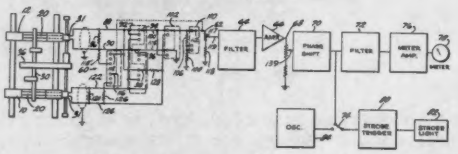
3,608,380
TESTING OF ROD-LIKE ARTICLES, SUCH AS CIGARETTES
Douglas W. B. Muir, Biggar, Scotland, and Eryk Stefan Doerman and Robert James Hayward, London, England, assignors to Molins Machine Company Limited, London, England
Filed Jan. 30, 1969, Ser. No. 795,279
Int. Cl. G01m *3/26*
U.S. Cl. 73—45.1 **10 Claims**

Wrappings of cigarettes and similar articles are tested by creating a pressure differential radially across each wrapping to detect whether or not the wrapping is leaky. The cigarettes are carried in flutes in a carrier drum past co-operating closure drum which encloses the cigarettes in the flutes at a testing point between the two drums, at which point the two drums define a chamber around the cigarettes terminated at the ends of the cigarettes by seal portions defined partly by each of the drums to restrict



communication between the interior and exterior of a cigarette via the open ends of the cigarette wrapping.

3,608,381
BALANCING MACHINE WITH DIRECT READOUT
Gordon E. Hines, Ann Arbor, Mich., assignor to Balance Technology, Inc., Ann Arbor, Mich.
Filed July 28, 1969, Ser. No. 845,250
Int. Cl. G01m *1/08*
U.S. Cl. 73—462 **15 Claims**

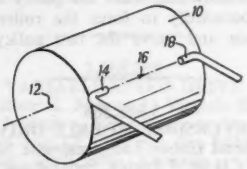


A balancing machine wherein the translation of bearing carriers in response to vibration of a test part supported on the carriers is detected by pickups to develop two test signals that are processed to provide a direct indication of the weight to be added in a given correction plane at a given correction radius. The signal processing circuit includes a selector switch to select a signal from each pickup individually or the sum of the signals from both pickups. There is a meter scale switch to select full scale meter deflections depending upon the weight range of the part under test. The selected signals are also processed through a correction radius potentiometer and also a part weight potentiometer that are calibrated directly in inches and pounds, respectively, so that the meter directly reads the weight that has to be added at a given correction radius.

3,608,382
FLUIDIC SPEED SENSORS
John William Leathers, Taplow, England, assignor to British Telecommunications Research Limited, Taplow, England
Filed July 1, 1969, Ser. No. 838,249
Claims priority, application Great Britain, July 1, 1968, 31,329/68
Int. Cl. G01p *3/34*
U.S. Cl. 73—521 **8 Claims**

A jet of fluid is directed along the surface of a body whose spread of movement is to be measured in a direction which is parallel to the plane of such surface and perpendicular to the direction of movement. When the surface is moving, boundary layer interaction between the jet

and the boundary layer of air or other fluid in contact with surface causes the jet to be deflected in the same direction as that of movement of the surface. A collector is disposed confronting the jet and, in accordance with whether the collector is aligned with the jet or whether it is displaced with respect to the jet in the direction of movement of the



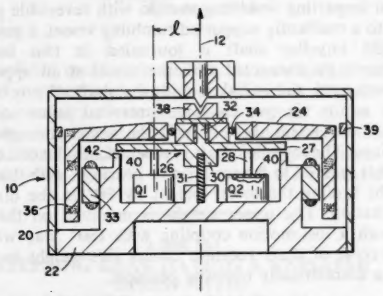
surface, a maximum signal output is received when the surface is stationary or when it is moving at a predetermined speed. The effective thickness of the boundary layer may be increased by providing two parallel surfaces moving in the same direction and at the same speed. The jet is then directed between the two surfaces.

3,608,383

SINGLE AXIS RATE GYRO AND PIEZOTRANSISTOR ANGULAR RATE DETECTOR

Joe S. Hunter and Little J. Little, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army

Filed Feb. 4, 1970, Ser. No. 8,504
Int. Cl. G01c *19/18, 19/28*
U.S. Cl. 74—5.6 **4 Claims**



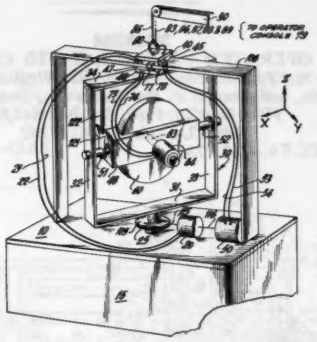
The single axis rate gyro has a piezotransistor pickoff for measuring angular rates of motion about a selected axis. Attitude deviation about the gyro sensitive axis develops corresponding stresses in a pair of piezotransistors arranged along the input axis. Output voltages are coupled from the transistor to a different amplifier when an angular rate occurs about the input axis. The output voltage from each transistor is proportional to the specific angular rate input. Error producing components of the output signal are canceled in the differential amplifier and a linear output component is doubled without amplification of unwanted signals. A pair of piezotransistors are fixed along the gyro input axis and are equally spaced on opposite sides of the spin axis. When an input angular rate occurs, a force transferring device responds to deviation between the spinning wheel and related support structure to place tension and compression on respective piezoelectrical components of the transistors, varying the voltage thereon and thereby changing the transistors output voltage. A current source maintains the transistors in a linear conductive state prior to receipt of stress forces and is adjustable to provide equal transistor output signals before stress is applied.

3,608,384

APPARATUS FOR ROTATIONALLY POSITIONING A SUPPORTED LOAD

Robert Allen Hardin, Murray Hill, N.J., assignor to Skagit Corporation, Sedro-Woolley, Wash.

Filed Jan. 3, 1969, Ser. No. 788,885
Int. Cl. G01c *19/00*
U.S. Cl. 74—5.22 **3 Claims**



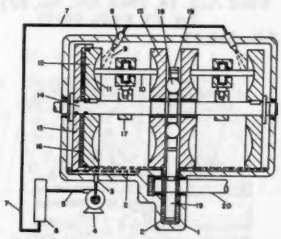
Apparatus for selectively horizontally orienting a freely swiveled cargo load, and for maintaining a desired horizontal position, employs a rotating flywheel attached to a load bearing platform by a mounting gimbal. Apparatus is provided to selectively rotate the spinning flywheel about a horizontal axis disposed along a diameter of the flywheel, thereby applying a torque in a desired direction about the vertical axis of the gimbal, platform and load. Thus, the load may be rotated in a horizontal plane to any desired orientation and, moreover, maintained in that position.

3,608,385

FRICTION DRIVE CONTAINING POLYOLEFIN FLUID

Irl N. Duling, West Chester, and Frederick P. Glazier, Thornton, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

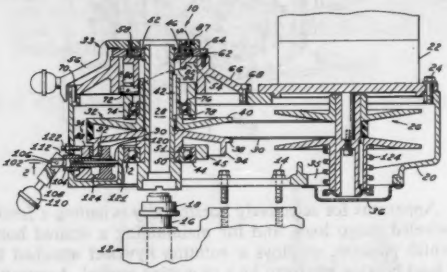
Continuation-in-part of application Ser. No. 679,833, Nov. 1, 1967. This application Jan. 24, 1969, Ser. No. 794,844
Int. Cl. F16h *15/08*
U.S. Cl. 74—200 **15 Claims**



A friction drive machine comprises a power input member and a power output member in tractive rolling contact relationship and an oxidation-resistant fluid film between said members, said fluid comprising a polymeric reaction product of C_2–C_8 olefin, said polymer preferably having an average molecular weight of 170–1000 (e.g., 300–500). The choice of molecular weight is determined primarily by the desired viscosity characteristics of the fluid (including the effect of any other components, such as low VI naphthenes). For example, a poly-3-methyl-

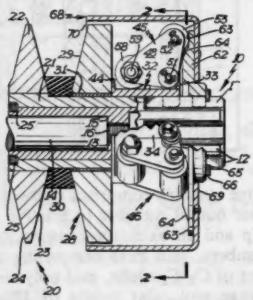
butene-1 oil (#31) or 361 average molecular weight has a KV at 210° F. of 5.47 cs., whereas an ethylene-propylene copolymer oil (#44) of 555 average molecular weight has a KV at 210° F. of 8.50 cs., and a poly-propylene oil (#25) having a KV at 210° F. of 5.679 has an average molecular weight of 457. The polymeric reaction product is preferably hydrogenated to effectively eliminate olefinic unsaturation.

3,608,386
CAM OPERATED VARIABLE RATIO BELT DRIVE
John M. Pambid and Harold E. Wiggins, Clarkston, Mich., assignors to F. Jos. Lamb Co., Detroit, Mich.
Filed July 25, 1969, Ser. No. 844,888
Int. Cl. F16h *57/10, 55/52*
U.S. Cl. 74—230.17A **5 Claims**



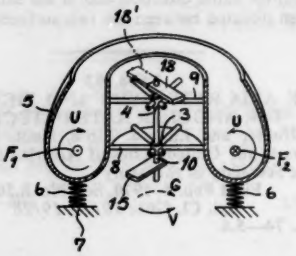
A power unit for use on machine tools having a motor flange-mounted on a housing with a self-adjusting pulley connected to a rotor shaft of the motor. The motor drives an output shaft of the power unit through a belt engaged between movable and fixed sheaves on the output shaft which provide a variable effective diameter pulley. The pulley on the output shaft is adjusted by a semi-circular cam and a cam follower connected to the movable sheave to control and vary the speed of rotation of the output shaft. Brake shoes actuated by a cam lever and a brake drum on a sheave of the output shaft selectively lock the output shaft against rotation.

3,608,387
CENTRIFUGALLY CONTROLLED, VARIABLE DIAMETER PULLEY
Anthony Fox, Bloomington, Minn.
(8306 Queen Ave. S., Minneapolis, Minn. 55431)
Filed Aug. 19, 1969, Ser. No. 851,279
Int. Cl. F16h *55/52*
U.S. Cl. 74—230.17 **8 Claims**



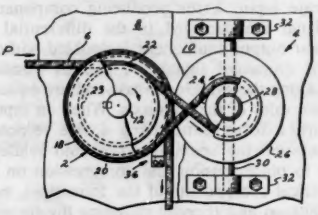
A centrifugally controlled, variable diameter, V-belt pulley designed to act as a torque converter, the pulley having pulley members with opposing inclined surfaces, one of which is fixed to a shaft and the other of which is nonrotatably and slidably secured to the shaft, a third member fixed to the shaft and having a bearing face, and a plurality of weighted triangular arms pivotally secured to a portion operatively connected to the slidable pulley member. Each of these arms carries a roller adapted to engage the bearing face of the third member. These arms are biased inwardly and when the pulley is rotated, the arms swing outwardly to force the rollers against the bearing surface and move the two pulley sections together.

3,608,388
REVERSIBLE WOBBLE DRIVE
Ernst Huber, Langernstrasse 30, CH 8037 Zurich, Switzerland
Filed Apr. 13, 1970, Ser. No. 27,484
Claims priority, application Switzerland, Apr. 11, 1969, 5,639/69
Int. Cl. B06b *1/16*
U.S. Cl. 74—87 **6 Claims**



For imparting wobbling motion with reversible precession to a resiliently supported tumbling vessel, a generally upright impeller shaft is journaled in two bearings mechanically connected with the vessel at an upper and a lower level and is linked with the shaft of a reversible drive motor via two cascaded universal joints so as to exert independent thrusts upon the vessel through these bearings. The impeller shaft is eccentrically loaded by two weights secured to it near the two bearings, with the upper weight leading the lower weight by 90° in the direction of rotation. The upper weight is mounted on the shaft through a lost-motion coupling with 180° play whereby a reversal of shaft rotation causes this weight to swing into a diametrically opposite position.

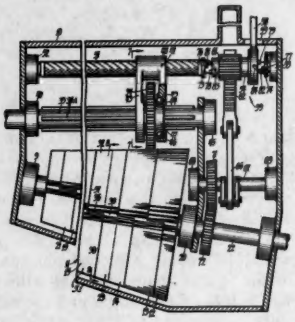
3,608,389
LOAD RESPONSIVE GRIPPING DEVICE FOR FLEXIBLE CABLE DRIVES AND THE LIKE
George C. Christian, 8 Grinnell St., Greenfield, Mass. 01301
Filed Dec. 5, 1969, Ser. No. 882,477
Int. Cl. F16h *7/08, 7/10, 7/12*
U.S. Cl. 74—242.9 **7 Claims**



A device for driving a flexible cable, rope, belt, or the like, and gripping the same with a presssure proportionally related to the pulling force of the load imposed thereon,

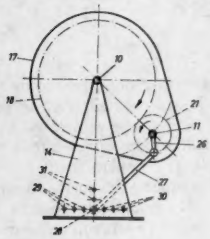
having a rotatable driving pulley and rotatable pressure applying roller, the pulley and roller being mounted for relative positional shifting movement, and, a lever engageable by the cable and responsive to the load of the pulling force thereon to cause the pressure roller to bear against the cable with a force proportionally related to the pulling load. The device may be used, for example, as a simplified and efficient driving means for a portable rope ski tow.

3,608,390
VARIABLE SPEED DRIVE
Arthur G. Barrett, 13 Virginia St., Newtown, Victoria, Australia
Filed Aug. 12, 1969, Ser. No. 849,398
Claims priority, application Australia, Aug. 12, 1968, 42,006/68
Int. Cl. F16h *3/08, 3/22*
U.S. Cl. 74—348 **11 Claims**



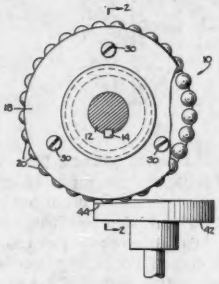
A variable speed ratio gear system utilizing a conical toothed member made up of an axial stack of gears with varying numbers of teeth, individual gears of the stack consisting of pairs of axially offset pairs, so that the peripheral interface line between adjacent gears has a portion extending generally lengthwise of the conical member.

3,608,391
STEPPING GEAR HAVING A VARIABLE SPEED RATIO
Gerd Rudolf Bargstedt, 2161 Drochtersen-Wischhafenersand, Germany
Filed Sept. 18, 1969, Ser. No. 859,115
Claims priority, application Germany, Sept. 18, 1968, P 17 75 744.7; July 3, 1969, P 19 33 721.4
Int. Cl. F16h *35/02, 37/12*
U.S. Cl. 74—394 **6 Claims**



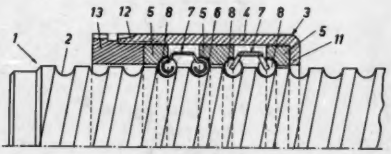
A stepping gear having a driving and a driven shaft with gear means therebetween, wherein at least one of the two said shafts is located in stationary bearings and one of the shafts is formed as or connected to a crank and wherein during rotation of the driving shaft a part of the gear means is adapted to be reciprocable, pivotable or rotatable in dependence upon the crank about the axle of another interconnected gear means, the rotation of the driven shaft being accelerated, decelerated or reversed thereby.

3,608,392
RIGHT ANGLE DRIVE
Jack J. Gilbert, Suffern, N.Y., assignor to Spyro Dynamics Corporation, Northvale, N.J.
Filed June 15, 1970, Ser. No. 46,306
Int. Cl. F16h *1/18, 55/06*
U.S. Cl. 74—424.5 **12 Claims**



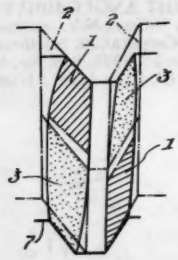
A right angle drive comprising a driven gear having its teeth mounted for radial movement restrained by a resilient ring and driven by a mating gear engageable with said teeth.

3,608,393
PLANETARY BALL SCREW MECHANISM
Sven Walter Nilsson, Partille, Sweden, assignor to SKF Industriele Handel-En Ontwikkeling Maatschappij NV, Amsterdam, Netherlands
Filed May 6, 1970, Ser. No. 35,221
Claims priority, application Sweden, May 6, 1969, 6,344/69
Int. Cl. F16h *1/20, 55/22*
U.S. Cl. 74—424.8 **11 Claims**



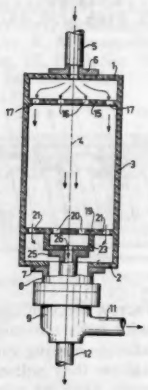
In a planetary ball screw mechanism of the type where the nut is provided with balls mounted in holders fitted between axially displaceable bearing rings, the holders are designed in such a manner they will each, together with the balls mounted therein, keep the adjacent bearing rings apart, which makes it possible to permit the main portion of the holder to extend outwards into the free space formed between said bearing rings. Hereby the clearance between the shaft and the nut may be kept at a minimum, whereby the grooves for the balls may be deep and suited to transfer high loads.

3,608,394
DOUBLE-THROATED WORM GEARING
Shoichi Ishikawa, Yokohama, Japan, assignor to Kabushiki Kaisha Hasegawa Haguruma Tekkosho, Tokyo, Japan
Filed Feb. 4, 1970, Ser. No. 8,584
Claims priority, application Japan, Feb. 13, 1969, 44/10,090
Int. Cl. F16h *1/16, 55/04*
U.S. Cl. 74—425 1 Claim



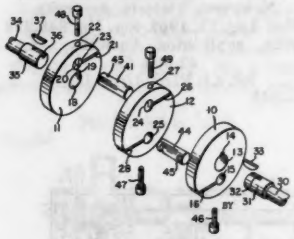
A double-throated worm gearing having an increased load-carrying capacity and an improved transmission efficiency. The worm gears can be produced by a generating method in a continuous fashion with increased efficiency. Particularly, the throated worm wheel has tooth surfaces each including a curved contacting zone effectively engageable with the mating throated worm in addition to a planar contacting zone corresponding to a portion of the planar tooth surface of conventional forms of throated worm wheel.

3,608,395
DRUM ROTOR
Gunnar Walter Brandt, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden
Filed June 17, 1968, Ser. No. 737,731
Claims priority, application Sweden, June 28, 1967, 9,556/67
Int. Cl. F16f *15/30;* B04b *7/00*
U.S. Cl. 74—572 4 Claims



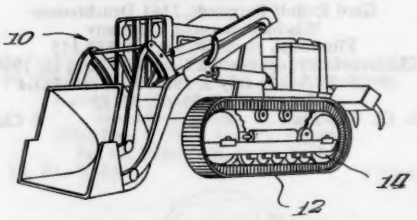
Drum rotor having a rotation-symmetrical, preferably cylindrical mantle and at least one end wall attached thereto and being adapted to be rotated about its axis. The material in the end wall has a ratio between density and module of elasticity which is so much higher than the corresponding ratio for the mantle that the elongations in the mantle and the end wall in the juncture therebetween due to the centrifugal force are essentially equal.

3,608,396
SECTIONAL CRANKSHAFT
Arthur P. Bentley, Box 139, Boerne, Tex. 78006
Filed Feb. 2, 1970, Ser. No. 7,680
Int. Cl. F16c *3/10*
U.S. Cl. 74—597 4 Claims



This specification discloses a sectional crankshaft, which, in its simplest form, comprises two main shafts in axial alignment and with ends in spaced relation, a cap plate for each of said ends in the form of a heavy disc that is keyed to a shaft end, an intermediate disc of the same size and shape as said cap plates and a pair of crank pins disposed 180° apart with one pin connecting one cap plate to the intermediate disc and with its axis offset with respect to that of the shafts and the other pin connecting the other cap plate to the intermediate disc with its axis similarly offset.

3,608,397
TRANSMISSION CONTROL SYSTEM
Robert G. Honeyager, Oak Creek, and James C. Rigney, Racine, Wis., assignors to J. I. Case Company
Filed June 30, 1969, Ser. No. 837,547
Int. Cl. F16h *37/06, 3/08;* B62d *11/00*
U.S. Cl. 74—665 16 Claims



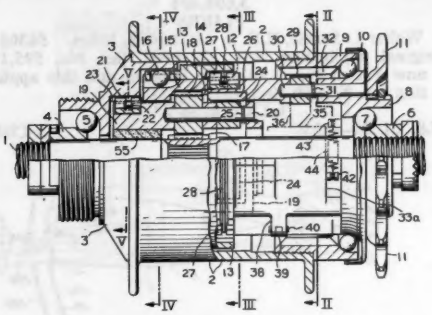
A hydraulic control system for controlling actuation of a plurality of fluid operated friction devices forming part of a transmission for a vehicle with the system including speed and direction valves and a range valve engaged at all speeds. The system further includes a modulator valve which reduces the pressure of fluid supplied to the range valve to selectively control engagement of fluid couplings associated therewith. The modulating valve is designed for automatic operation during normal shifting of the speed and direction valves between neutral and engaged positions and alternatively manually operable at the discretion of the operator.

3,608,398

BICYCLE HUB HAVING A BUILT-IN THREE-STAGE SPEED CHANGE MECHANISM

Takashi Segawa and Ryuichi Yamamoto, Osaka, Japan, assignors to Shimano Kogyo Kabushiki Kaisha, Sakai, Osaka, Japan

Filed Sept. 15, 1969, Ser. No. 857,745
Claims priority, application Japan, Sept. 24, 1968, 43/68,218; Sept. 27, 1968, 43/70,556
Int. Cl. F16h 5/42
U.S. Cl. 74—752 3 Claims



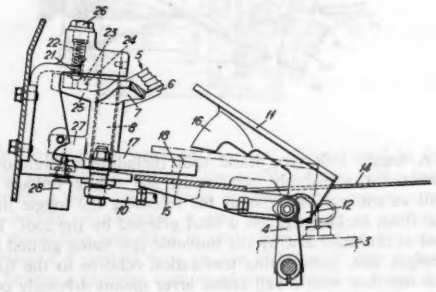
A bicycle hub having a built-in three-stage speed change mechanism in which a high and a normal speed-ratio transmission ratchet gearing are arranged adjacent to each other, and an automatic speed-ratio control means is provided consisting of centrifugal governor weights oscillatable inwardly and outwardly around the axis of said hub in synchronism with each other according to the driving speed of the bicycle, said ratchet gearings being adapted to be automatically put into and out of engagement individually by the common speed-ratio control means upon oscillation thereof thereby effecting automatic three-stage speed change.

3,608,399

VEHICLE CONTROLS

William Knight, Coventry, England, assignor to Coventry Climax Engines Limited, Coventry, England

Filed Mar. 27, 1970, Ser. No. 23,400
Claims priority, application Great Britain, Apr. 30, 1969, 21,997/69
Int. Cl. B60k 21/00
U.S. Cl. 74—850 6 Claims



An industrial truck has a horizontally pivoted accelerator pedal to control the throttle of an I.C. engine by which the truck is powered and a vertically pivoted selector pedal which is linked to a hydraulic torque converter and which has three positions giving forward drive, reverse drive and neutral respectively. A rigid locking piece projects downwardly from the accelerator pedal and, upon movement of the accelerator pedal from an upper limiting position giving idling of the engine, engages a slotted arm which moves with the selector pedal and thereby locks the selector pedal.

3,608,400

METHOD FOR PRODUCING A TWIST DRILL OR A SIMILAR TOOL HAVING ONE OR MORE HELICAL FLUTES OR GROOVES AND A TOOL PRODUCED BY SAID METHOD

Louis Aackersberg Mortensen, Hillerodvej 1, DK-3480 Fredensborg, Petersholm, Denmark

Filed Aug. 22, 1969, Ser. No. 852,212
Int. Cl. B21k 5/02
U.S. Cl. 76—108T 4 Claims

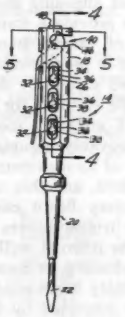
A method, wherein a twist drill or a similar tool having one or more helical flutes or grooves is produced from a rod-shaped blank having a core with a substantially circular cross section from which one or more circumferentially spaced ridges or ribs extend radially and axially. When twisted, the core of the blank constitutes a columnar circularly cylindrical core of the tool, and in connection with the cylindrical surface of the core the side walls of the ridges or ribs define the flutes or grooves of the tool.

3,608,401

COMBINATION WIRE STRIPPING AND CUTTING DEVICE

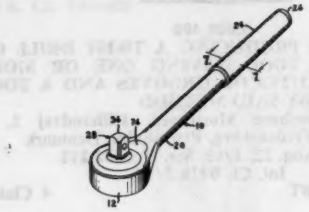
Marvin J. Freed, 330 S. Barrington 202, Los Angeles, Calif. 90049

Filed May 26, 1969, Ser. No. 827,796
Int. Cl. H02g 1/12
U.S. Cl. 81—9.5R 1 Claim



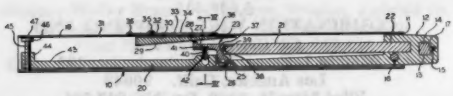
A wire stripping and cutting device confined in the handle portion of a tool comprising a plurality of apertures having sharpened inserts for stripping insulation from electrical wires of different gauges and including a pivoted wire cutting means disposed at one end with the handle portion thereof useful as a pocket clip for attachment of the device to a garment pocket.

3,608,402
RATCHET TOOL
Marsdon P. Rainey, Shawnee Mission, Kans., assignor to Bradley and Wharton, Kansas City, Mo.
Filed Sept. 2, 1969, Ser. No. 854,378
Int. Cl. B25b *13/46*
U.S. Cl. 81—63.1 **9 Claims**



A ratchet tool having a rotatable handhold coupled with a shaft telescoped in a tubular handle. A rod of spring material offset radially from the shaft axis projects from the end of the shaft between a pair of interconnected wedges to move the latter to corresponding direction changing positions upon manual rotation of the handhold about its longitudinal axis.

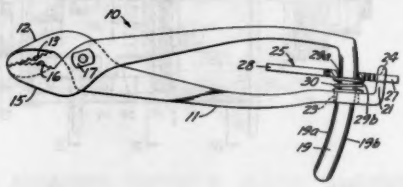
3,608,403
AUTOMATIC TORQUE RELEASE WRENCH OF THE PRESET TYPE
Talmage O. Green, Glen Ellyn, Ill., assignor to Snap-On Tools Corporation, Kenosha, Wis.
Filed May 21, 1969, Ser. No. 826,578
Int. Cl. B25b *29/02*
U.S. Cl. 81—52.5 **12 Claims**



The structure embodies an elongated tubular handle member with a work engaging member projecting therefrom at one end to provide a transverse shank to which detachable sockets of various standard sizes are applied to turn fasteners to a predetermined torque load. Confronting primary and secondary flex beams are disposed in the tubular handle member for engagement with each other and the work engaging member. A spring urged trigger release is movably mounted to the primary flex beam in the region of its maximum flex responsive to resisting the torque load, and this trigger release is in the path of the secondary beam end to normally engage therewith until the trigger moves with the flex of both beams to engage the internal wall of the tubular handle member, thereby releasing its connection therewith when the load in the primary beam equals the combined bending load originally sustained by both primary and secondary beams.

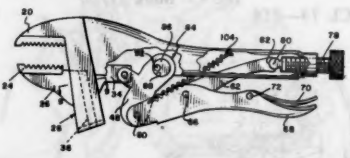
When this occurs, the primary beam with its retained elasticity reserve, does not present a completely solid reaction should there be inadvertent over torqueing applied to the fastener or work engaging member after the trigger releases. The manual release of the handle member after the preset load has been applied, permits the spring to urge the trigger to again connect with the secondary beam for automatic resetting with the beams returning to their original straight line position relative to each other and the handle member. A calibrated wall sliding wedge provided on the handle member in the path of the trigger release member affords variable adjustment in the preset mechanism within a wide capacity range. An adjustment screw at the free end of the primary beam for engagement with the handle wall and accessible through an aperture therein, provides for accurate setting thereof by the user over an extended period of operation.

3,608,404
PLIERS
Walter L. Sarvie, R.R. 3, Alexandria, Minn. 56308
Original application Nov. 17, 1966, Ser. No. 595,107, now Patent No. 3,442,159. Divided and this application Jan. 2, 1969, Ser. No. 788,521
Int. Cl. B25b *7/14*
U.S. Cl. 81—323 **3 Claims**



A lock type pliers has an elongate lock engaging element affixed to the end of one handle to extend angularly therefrom. The lock engaging element projects through an opening in the adjacent end of the other handle. An apertured locking member is mounted on an extension of the apertured handle and is spring urged in a locking direction. The lock engaging element projects through and is engaged by the locking element, and is releasably locked thereby.

3,608,405
TOGGLE LINK HAND TOOL HAVING RECTILINEAR JAW MOVEMENT
Charles C. Schmidt, Topeka, Kans., assignor to Mara, Inc., Topeka, Kans.
Filed Feb. 7, 1969, Ser. No. 797,632
Int. Cl. B25b *7/04, 7/12*
U.S. Cl. 81—356 **11 Claims**



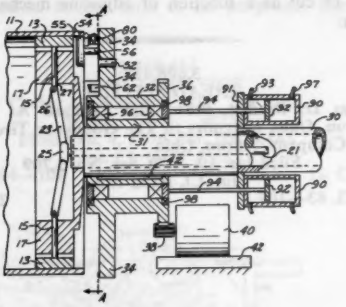
A toggle link type hand tool including conventional means for adjustably positioning the toggle linkage as well as conventional means for releasing the toggle linkage from locking against a load gripped by the tool. The tool is characterized by the movable jaw being guided for straight line, nonrotating translation relative to the fixed jaw together with a bell crank lever means drivingly connecting the toggle linkage to the movable jaw. Inasmuch as the toggle linkage and the movable jaw respectively travel straight line and curvilinear paths relative to the fixed handle and jaw, the bell crank lever means has a fulcrum that is automatically movable to accommodate such different motions.

3,608,406

APPARATUS AND METHOD FOR FORMING PRECISION SURFACES ON ENDS OF PIPES AND ANALOGOUS ANNULAR SURFACES

Joseph R. Paysinger, Eugene F. Sims, and Jerome W. Nelson, Houston, Tex., assignors to CRC-Crose International, Inc.

Filed July 9, 1968, Ser. No. 743,566
Int. Cl. B23b *1/00*
U.S. Cl. 82—1 8 Claims



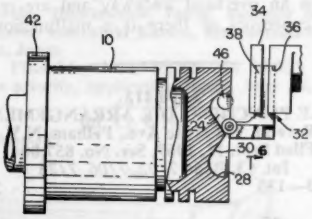
For forming precision shaped surfaces on the ends of large steel pipe and analogous annular structures, a rotating face plate is supported adjacent the end of the annular member and aligned with the end surface by means of an internal clamp which fits into the annular member. This holds the face plate in predetermined aligned position. Cutting tools are supported on holder elements which are resiliently mounted and include means for rolling contact with the internal surface of the annular member. In this way a true and uniform surface configuration is obtained on the pipe end, regardless of minor eccentricity or other deviations from a true circular form.

3,608,407

TOOL AND METHOD FOR PROCESSING PISTONS

Thomas J. Hitzemann, 3319 Figel Ave., Fort Wayne, Ind. 46805

Filed Apr. 14, 1969, Ser. No. 815,824
Int. Cl. B23b *3/00*; B26d *1/00*
U.S. Cl. 82—1 2 Claims



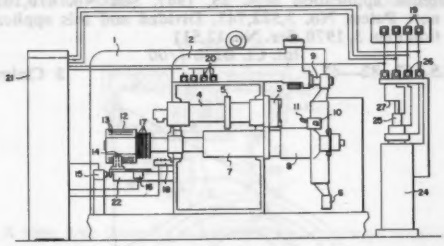
In forming the working faces of pistons used in internal combustion engines, the profile of the piston face includes a concavely formed groove and a conical central portion. Previously, it was the practice to perform the machining operation in two steps, the first step was to remove a central boss on the piston and then a tool bit having a circular cutting edge was used to form the concave groove and finished profiling the conical central portion. In the present invention, I use a tool bit having polyfaced cutting edges in which there is combined with the circular cutting bit a second cutting bit which is transversely disposed with respect to the circular cutting bit and which removes sufficient metal in advance of the circular cutting bit so that the circular cutting bit can perform the finished machining operation forming the central conical portion on the piston. The forming operations take place simultaneously so that in this manner I can perform the entire machining operations in a single step with a single tool.

3,608,408

DEVICE FOR REGULATING A CAM-CONTROLLED MACHINE TOOL

Franz Reiners, Post Berg, Erkelenz-Land, and Georg Walk, Rheydt, Germany, assignors to A. Monforts, Monchen-Gladbach, Germany

Filed Dec. 19, 1969, Ser. No. 886,666
Claims priority, application Germany, Dec. 21, 1968, P 18 16 401.7
Int. Cl. B23b *25/06*
U.S. Cl. 82—21 4 Claims



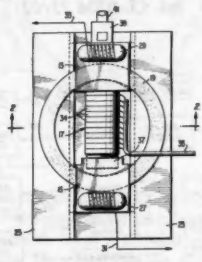
Device for regulating a cam-controlled machine tool includes measured value transmitter means connected to nominal value potentiometer means for transmitting a signal to the latter in accordance with a measured machining dimension of a control workpiece for automatically preadjusting the nominal value potentiometer means to fix the end position of the multitool-carrying turret of the machine tool, so that servomotor means operatively connected to the nominal value potentiometer means and to actual value potentiometer means which sense the actual axial position of a terminal switch relative to a control drum connected to the turret, are automatically actuable in response to a difference of the nominal and actual values for relatively displacing the terminal switch and control drum to adjustably displace the turret axially to its end position.

3,608,409

CATERPILLAR MICRO POSITIONER

Ewald E. Schmidt, Lanham, Md., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

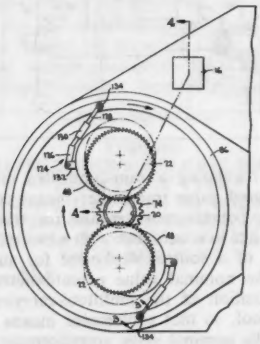
Filed Sept. 24, 1969, Ser. No. 860,493
Int. Cl. B23b *21/00*
U.S. Cl. 82—24R 1 Claim



This disclosure describes a caterpillar micro positioner for use in an aspherical or other similar machine. The micro positioner includes front and rear sliding holders

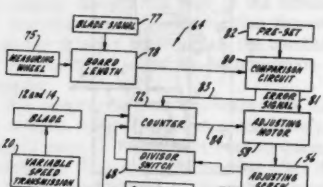
and an electromechanical or other incremental driver. The driver connects the front and rear sliding holders and incrementally moves one holder with respect to the other holder. An outwardly extending tool is attached to the front holder. Electromagnetic holding means are held in each of the sliding holders and alternately energized to hold one of the holders in a fixed position while the other holder is moved. In addition, a flex ring is provided and coupled to the front and rear holders so as to place the driver under compression, thereby eliminating slack or play from the various mechanical interconnections between the driver and the holders and from the driver per se.

3,608,410
ROTARY SEVERING METHOD AND APPARATUS
Raymond G. Brownstein, 300 Fountain Ave., Ellwood City, Pa. 16117
Original application Sept. 25, 1967, Ser. No. 670,195, now Patent No. 3,522,747. Divided and this application Feb. 3, 1970, Ser. No. 12,511
Int. Cl. B23b *1/00*
U.S. Cl. 82—47 3 Claims



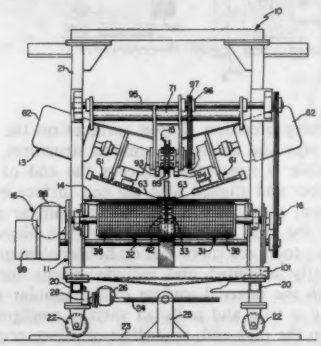
A method and means for severing a longitudinally extending stationary workpiece wherein at least one movable severing element, such as a circular saw, is provided. The severing element is orbited about the longitudinal axis of the workpiece while being simultaneously rotated about its own axis of rotation. The rotating and orbiting severing element can be selectively displaced toward the stationary workpiece to contact and thereby sever the same.

3,608,411
LENGTH CONTROL METHOD AND APPARATUS
Robert W. Schmidt, 5744 W. 77th St., Oak Lawn, Ill. 60459
Filed Aug. 20, 1969, Ser. No. 851,582
Int. Cl. B23d *25/02*
U.S. Cl. 83—38 12 Claims



A method and apparatus for automatically and accurately controlling the length of cuts made on a continously running strip of feed stock. A comparison circuit receives information on the length of cut being made by a blade device, compares this with a pre-set length value, and produces an error signal if any length correction is required. The error signal actuates an adjusting motor to operate in the required direction and vary the speed ratio of a transmission through an adjusting mechanism to adjust the timed relationship of blade cut with respect to material feed rate. The adjusting motor is stopped when the length of cut is varied the required amount by a circuit which follows the non-linear curve of length of cut as a function of adjusting mechanism operation.

3,608,412
TREAD SLITTER
William D. Braden, Stow, and Leonard A. Vandale, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 19, 1970, Ser. No. 3,709
Int. Cl. B26d *1/20*
U.S. Cl. 83—107 29 Claims



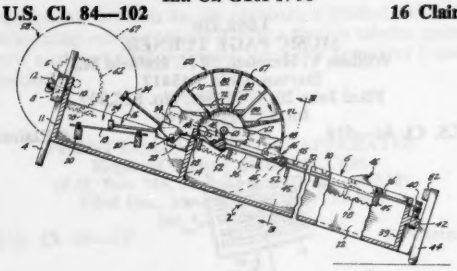
A machine for separating a pair of sidewalls from an extruded piece of tread including the sidewalls. The machine has a feed conveyor for carrying the extruded tread to a cutter where the sidewalls are cut from the tread, and a number of discharge conveyors for removing the individual pieces of tread and sidewall from the machine after the cutting operation is completed. A mechanism is provided for engaging the tread moving on the feed conveyor, and guiding it through the cutter and on to the discharge conveyor. The cutter and guide mechanism are mounted on an overhead trackway and are retractable from the conveyors, if there is a malfunction of the machine.

3,608,413
HOLE PUNCHING DIE ARRANGEMENT
Domenic Borello, 142 Nyac Ave., Pelham, N.Y. 10803
Filed Sept. 11, 1969, Ser. No. 857,004
Int. Cl. B26d *7/02, 7/06, 7/26*
U.S. Cl. 83—133 2 Claims

A plurality of cooperating male and female hole punching members respectively mounted in upper and lower

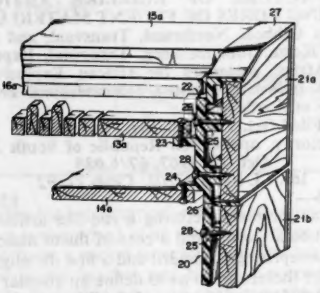
die plates with an intermediate die plate held by upper and lower sets of resilient means between the upper and lower die plates. By adjusting the relative forces exerted by the resilient means, during a power stroke the lower set yields first to allow the intermediate die plate to ease into holding engagement with the material during hole punching operation, and during the return stroke the upper set is first to cause withdrawal of the male punching members from the material while the material is still being held. As a consequence, numerous holes are effectively punched having little or no peripheral burrs.

3,608,414
MUSICAL DEVICE
Curley H. Williams, 2205 2nd Ave., Seattle, Wash. 98121
Filed Feb. 4, 1970, Ser. No. 8,465
Int. Cl. G10f *1/08*
U.S. Cl. 84—102 **16 Claims**



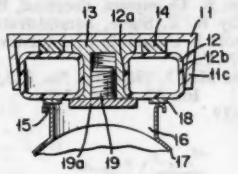
A musical device is disclosed which includes a set of pressure operated actuators for producing the musical notes, which are supported on a frame in relatively staggered operative positions along the incline of a downwardly inclined face of the frame; and an activator which is manually releasably supported above the actuators on the frame, and responsive to gravitational force when released, to translate downwardly along an incline parallel to the face of the frame, in pressure-applicable engagement with the actuators, to operate the same, while rotating about an axis extending crosswise of the face.

3,608,415
HOUSING FOR A KEYBOARD MUSICAL INSTRUMENT
Shuji Muraki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan
Filed May 20, 1970, Ser. No. 39,033
Claims priority, application Japan, May 26, 1969, 44/48,261
Int. Cl. G10c *3/02*
U.S. Cl. 84—177 **4 Claims**



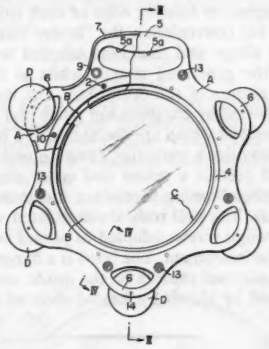
A housing for a keyboard musical instrument has a pair of side board assemblies each comprising of an inner board provided on its one side with projections supporting keyboards and a key bed, and an outer board fitted to the other side of the inner board with a predetermined space therebetween, the inner board being molded from plastics material integral with the projections. The housing becomes easy of assemblage and is imparted a sense of massiveness without increasing its substantial weight.

3,608,416
TONE HOLE COVERING ASSEMBLY FOR WOODWIND MUSICAL INSTRUMENTS
Akira Nagao, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan
Filed June 22, 1970, Ser. No. 48,383
Claims priority, application Japan, June 23, 1969, 44/49,213
Int. Cl. G10d *9/04*
U.S. Cl. 84—380 **3 Claims**



A tone hole covering assembly for a woodwind musical instrument comprising a pad cup and an enclosed, hollow pad received therein, the pad being filled with air compressed to a sufficient extent to cause the outer surface of the pad to contact the annular edge of a tone hole of the instrument in an airtight manner when the cup is operated to cover the tone hole.

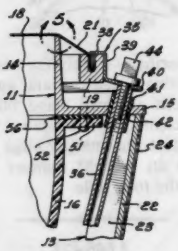
3,608,417
TAMBOURINE
Yoshiyuki Koishikawa, 2365 Kawarada-cho, Yokkaichi Mie Prefecture, Japan
Filed Mar. 26, 1970, Ser. No. 22,844
Claims priority, application Japan, Dec. 4, 1969, 44/114,676
Int. Cl. G10d *13/02*
U.S. Cl. 84—418 **9 Claims**



A tambourine made of a pair of synthetic resin front and back annular frames to be overlapped and affixed to one another so as to form a stepped or channel shape in cross-section area for clamping the skin with the help of a similar material skin-tensioning ring interposed between the internal peripheral edges of the respective frame pieces. The frame pieces are each provided with generally peripherally spaced projections and recesses respectively

to be complementally engaged with those on the other opposed frame piece and are also provided with a hand grip portion. The frames also have recessed portions for fitting bells within the outer peripheral edges of said annular pieces. The skin or a sheet is provided with circumferentially spaced peripheral attaching holes to receive the aforementioned projections of the annular frame, and the skin is adapted to be tightly held between the respective annular pieces of said two frames. As a part of the tambourine assembly, the annular tightening piece has a stepped cross-section with an offset portion to tension the sheet while cooperating with the corresponding stepped portion or recessed channel between the frames, and further includes a suitable hand grip, and fastener means for tightly interconnecting the pair of frames.

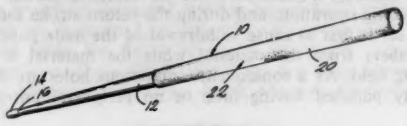
3,608,418
KETTLEDRUM
William H. Chaffee and Donald G. Canedy, Hinsdale, Ill., and Josephus B. Thompson, deceased, late of Covington, Ohio, by K. E. Stade, administrator, Covington, Ohio, assignors to Columbia Broadcasting System, Inc., New York, N.Y.
Filed May 7, 1969, Ser. No. 823,539
Int. Cl. G10d *13/04*
U.S. Cl. 84—419 **26 Claims**



A kettledrum incorporating a ring which acts as a bridge over which the drumhead is stretched, as a means to mount the bowl in sealed and dependent relationship, as a means to minimize transmission of vibrations from the drumhead to the bowl, as a guide for pull rods which are utilized in changing the pitch of the drumhead, and as a protective element preventing any shifting of the counterhoop or flesh hoop despite rough handling of the instrument. The upper or bearing edge of such ring (which may be termed, for convenience, the "bridge ring") has a predetermined shape and thickness adapted to improve the quality of the generated sounds while at the same time preventing cutting of the drumhead. The indicated bridge ring is supported by combination guide and support struts the lower ends of which are connected to a base ring. Such base ring provides a mounting function and also serves to enclose and protect a spider and cover element through which drumhead-tuning forces are transmitted directly to the pull rods. The pull rods are associated with the counterhoop through screws adapted to permit very fast initial tuning of the instrument. The bowl is a flanged hemisphere devoid of holes and smooth on the inside, such hemisphere being formed by blowing a heated sheet of acrylic plastic or the like.

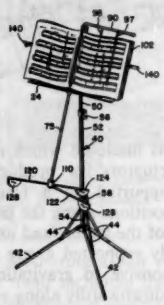
3,608,419
DRUMSTICK
Michael F. Russell, 2451 Greenwood Road, Lapeer, Mich. 48446
Filed Jan. 15, 1970, Ser. No. 3,104
Int. Cl. B10d *13/00*
U.S. Cl. 84—422 **5 Claims**

A drumstick including an elongate body having a striking tip portion at one end thereof, grip means secured to and encompassing the body at a position spaced from the striking tip portion thereof, the grip means being comprised of a plurality of very fine, flexible, closely packed, relatively short nylon fibers projecting outwardly from



the body in a direction generally normal to the surface of the body, the inner ends of the fibers being bonded to the body whereby the fibers form a soft, velvet-like seamless grip.

3,608,420
MUSIC PAGE TURNER
William V. Hazelett, 50 N. Hatfield St., Dayton, Ohio 45417
Filed June 20, 1969, Ser. No. 835,007
Int. Cl. G10g *7/00*
U.S. Cl. 84—516 **6 Claims**

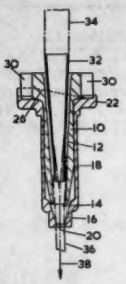


A music rack is provided with a generally vertical shaft mounted for rotation on the standard. At one end of the shaft there is a gripping arm which extends horizontally above a book of music, the arm including a pair of downwardly extending members for engaging a page of music. At the other end of the shaft there is a series of outwardly protruding arms which the musician can manipulate with his knee to effect turning of the shaft, gripping arm, and page of music. The arms are arranged such that the musician may turn the page by using his knee to effect a 180° turn of the shaft.

3,608,421
MANUFACTURE OF ROD-LIKE ARTICLES HAVING CORES OF FLUENT MATERIALS
Trevor Rex Gibbon, Northrand, Transvaal, and Stephen Walters Kotze, Johannesburg, Transvaal, Republic of South Africa, assignors to African Explosives and Chemical Industries Limited, Johannesburg, Transvaal, Republic of South Africa
Filed Oct. 11, 1968, Ser. No. 766,810
Claims priority, application Republic of South Africa, Oct. 12, 1967, 67/6,088
Int. Cl. F42b *33/02*; **C06b** *21/02*
U.S. Cl. 86—1 **13 Claims**

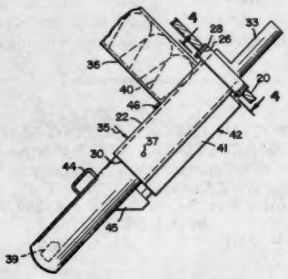
Apparatus for manufacturing a rod-like article having a flexible tubular casing and a core of fluent material, the apparatus comprising a mandril and a first die aligned and spaced apart therefrom so as to define an annular passage therewith for forming a strip of flexible material into a tubular casing, the mandril being adapted to permit a fluent material to be fed into the tubular casing, a second die having an opening of cross-sectional area smaller

than that of the first die and in alignment with the opening of the first die so as to permit the tubular casing to be displaced through the dies, and means for adjusting



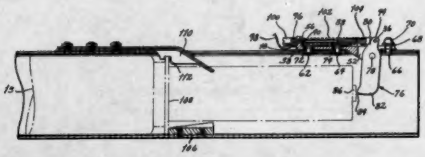
the spacing between the die openings; a method for manufacturing rod-like articles having a flexible tubular casing and a core of fluent material, using this apparatus is also disclosed.

3,608,422
FRONT LOADING FIRING APPARATUS
Reginald Bretnor, Berkeley, Calif.
(P.O. Box 748, Jacksonville, Oreg. 97530)
Filed Dec. 16, 1968, Ser. No. 783,902
Int. Cl. F41f *1/06*
U.S. Cl. 89—1F **11 Claims**



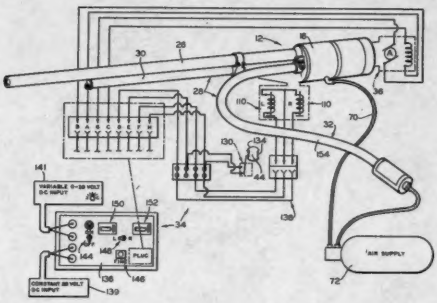
A front loading automatic high angle firing apparatus for launching projectiles from enclosed positions.

3,608,423
ELECTRICAL CONTACT ASSEMBLY FOR ROCKET LAUNCHERS
John J. Nash, Ferguson, Mo., assignor to Alsco, Inc., St. Louis, Mo.
Filed Oct. 23, 1968, Ser. No. 769,991
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.807 **4 Claims**



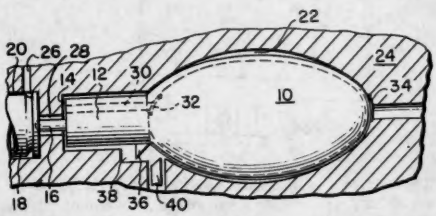
A spring-loaded electrical contact assembly for rocket launchers is comprised of an elongated striker arm bracket mounted upon a rocket-launching tube, a striker pivotally mounted to the bracket and having a portion extending within the launching tube and contacting the ignition cap of a rocket positioned therein, means for introducing electrical current to the striker, and spring means operatively connected to the bracket. The spring means yieldably urges the striker about its pivotal connection with the bracket so that a portion of the striker is yieldably held in electrical contact with the ignition cap of the rocket.

3,608,424
FEEDING MECHANISM OF AN AUTOMATIC CANNON FOR FIRING CASELESS AMMUNITION
Harold H. Wiese, Davenport, Iowa, assignor to the United States of America as represented by the Secretary of the Army
Filed Oct. 8, 1969, Ser. No. 864,849
Int. Cl. F41d *7/04*
U.S. Cl. 89—13R **11 Claims**



The feeding mechanism of an automatic cannon includes a four-chamber drum which is selectively driven in opposite directions by a reversible electric motor. A Geneva movement is operationally disposed between the motor and drum to provide intermittent rotation thereof for successively rotating each of the chambers to four stations including a firing station, an ejection station, and two loading stations oppositely disposed therebetween, and pausing momentarily at each station for loading and firing functions. A magazine is mounted at each loading station for registry with the chambers when respectively indexed thereat, and solenoid actuated gates control the passages of the rounds from the magazines to the chambers. An electrical system, through a microswitch actuated by the Geneva movement, controls the operation of the gates so as to feed the rounds from one magazine to the indexed one of the chambers when the drum is rotated in one direction and from the other magazine to the indexed chambers when the drum is rotated in the opposite direction.

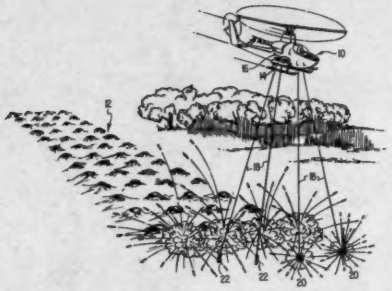
3,608,425
HIGH SPEED FIRING MECHANISM
Gilbert S. Jackson, West Hyattsville, Md., assignor to Jesse D. Steele, Chevy Chase, Violet Ann Ash, Rockville, and Nicholas J. Aquilino, Crofton, Md., fractional part interest to each
Filed Dec. 31, 1968, Ser. No. 788,223
Int. Cl. F41d *11/16*
U.S. Cl. 89—27 **5 Claims**



A high speed actuator operable in response to generated gases including an actuator pin, a pressure respon-

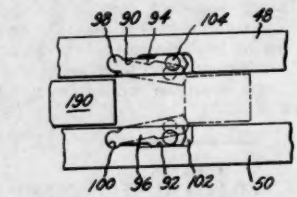
sive surface and a pressure responsive chamber whereby gas pressure against the pressure responsive surface creates a backward thrust and gas pressure buildup within the chamber creates a forward thrust.

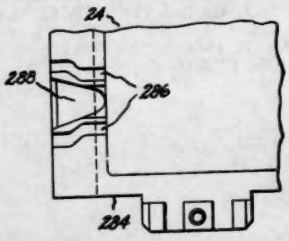
3,608,426
DOWN-FIRE ARMAMENT POD FOR HELICOPTERS
Lester L. Jackson, Jr., Towson, Md., assignor to Martin Marietta Corporation, New York, N.Y.
Filed Feb. 14, 1969, Ser. No. 799,294
Int. Cl. F41d *11/24*
U.S. Cl. 89—37.56 3 Claims



A down-fire armament pod for helicopter use carrying at least one pair of vertically oriented grenade launchers with limited roll axis and firing rate adjustment for complete saturation of a target area with fragmentation environment at differing helicopter altitudes and flight velocities.

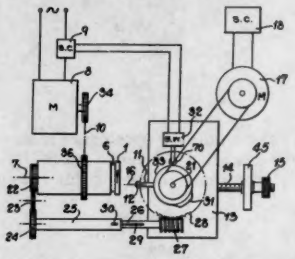
3,608,427
BOLT LOCKING SYSTEM
Richard H. Colby, Hamden, Mass., assignor to General Electric Company
Filed Apr. 7, 1969, Ser. No. 814,083
Int. Cl. F41d *3/00*
U.S. Cl. 89—176 4 Claims





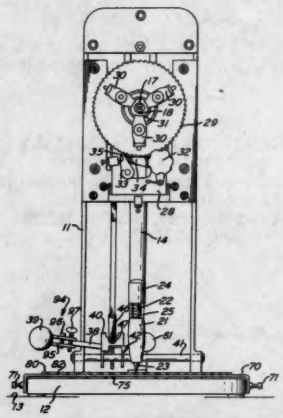
A machine gun is disclosed having a receiver, a barrel with an extension mounted for recoil movement in the receiver, a bolt having a web mounted for recoil movement in the receiver with a bolt head extending up therefrom into said barrel extension and a cartridge case ejection aperture therein, and locking lugs mounted in the barrel extension and controlled by the receiver for locking the bolt head.

3,608,428
SPIRAL GROOVE CUTTING APPARATUS
Jack J. Gilbert, Suffern, N.Y., assignor to Spyro Dynamics Corporation, Northvale, N.J.
Filed Mar. 4, 1970, Ser. No. 16,488
Int. Cl. B23f *1/06*; B23c *3/28*
U.S. Cl. 90—3 7 Claims



Apparatus for cutting a spiral groove of arcuate cross-section and varying in depth in accordance with a predetermined radius in a face gear blank comprising means for holding and rotating the blank, means for holding and rotating a cutting tool having an arcuate face around its own axis while turning it about an axis perpendicular thereto at a rate synchronized with the rotation of said blank and means for moving the tool into engagement with said blank.

3,608,429
ATTACHMENT KIT FOR COPYING MACHINE FOR ENGRAVING JEWELRY RINGS
George Berlant, Bellerose, N.Y., assignor to New Hermes Engraving Corporation, New York, N.Y.
Filed Dec. 24, 1969, Ser. No. 887,947
Int. Cl. B23c *1/16*
U.S. Cl. 90—13.1 12 Claims



An attachment kit for modifying a copying and engraving machine that utilizes a pattern carrier of a standard diameter so that it can copy indicia from a plurality of circular pattern carriers of different diameters. An adapter bracket properly positions the circular pattern carries so that they can be engaged by a tracing tool. Additionally, the attachment kit includes a locking member that cooperates with the locking member on the

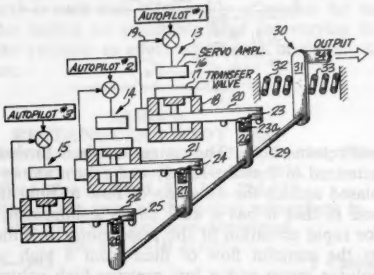
machine that normally engages the standard pattern carrier so that the non-standard pattern carriers can be locked in position so that the indicia thereon can be copied and engraved. Furthermore, the attachment kit includes a member that limits the spacing between engraved characters to a predetermined distance and a screw device that controls the depth of the engraving cut.

3,608,430

METHODS FOR FORMING AIRCRAFT REDUNDANT CONTROL SYSTEMS AND SYSTEMS FOR CARRYING OUT THE METHODS

John P. Headlund, Bellevue, and Odd Justad, Issaquah, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed June 29, 1970, Ser. No. 50,616
Int. Cl. F01b 25/00; F15b 11/16
U.S. Cl. 91—1 18 Claims



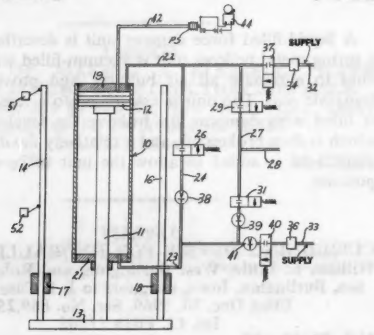
Methods for forming dual and triple redundant control systems and systems for carrying out the methods are disclosed. The dual and triple redundant control systems, such as, but not limited to airplane autopilot control systems are set forth for mechanically combining the command outputs of the two or three independent autopilots and their servo units and detent connections between the servo units and a system output for providing an output signal representative of the mid-valued output between the other two outputs or between the other output and neutral. These systems are entirely mechanical, utilizing two or thrge spring loaded detents and a spring centering device.

3,608,431

CONTROL SYSTEM FOR THE RAM OF VERTICALLY DISPOSED FLUID PRESSURE CYLINDERS

William C. Pease III, Columbus, Ga., assignor to Lummus Industries, Inc.

Filed July 14, 1969, Ser. No. 841,381
Int. Cl. F15b 11/15, 13/44, 13/16
U.S. Cl. 91—361 3 Claims



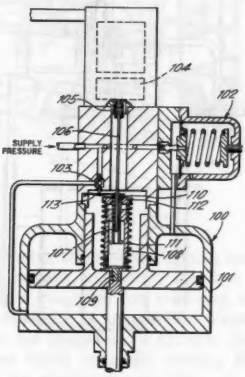
A system for operating fluid pressure cylinders, particularly cylinders powered by compressible gases in which the cylinder is arranged vertically so that on its working stroke the ram of the cylinder moves downwardly. A control system for the cylinder interconnects the ends of the cylinder on the downward stroke of the ram so that the fluid under pressure in the lower end and which has been used to raise the ram flows into the upper end so that the ram falls downwardly by gravity. By thus interconnecting the ends of the cylinder at the time indicated the ram moves down, on its working stroke, without being connected to the source of gas under pressure. Further details include means to admit gas under pressure to the upper end of the cylinder when the interconnecting procedure is insufficient to cause the ram to complete its working stroke.

3,608,432

SERVOMECHANISMS INCLUDING ELECTRICAL STEPPER MOTORS

Peter Walton, Gloucester, England, assignor to Serck Industries Limited, Birmingham, England

Filed Feb. 14, 1969, Ser. No. 799,883
Claims priority, application Great Britain, Feb. 14, 1968, 7,186/68
Int. Cl. F15b 9/10, 15/17
U.S. Cl. 91—380 7 Claims



A servomechanism in which a feed back connection is provided between an output member and a control member. The feed back connection has a first part on the output member and a second part adapted to be displaced relative to the first part by a stepper motor unit and coupled to the control member by a coupling permitting continuing movement of the second part when the control member is at one end of its travel.

3,608,433

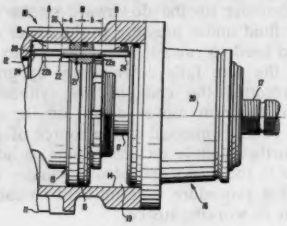
VALVE ARRANGEMENT IN THE WORKING PISTON OF A PRESSURE-MEDIUM OPERATING CYLINDER

Dirk Buisman, Leichlingen, and Otto Lattner, Stuttgart-Bad, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Apr. 11, 1969, Ser. No. 815,307
Claims priority, application Germany, Apr. 13, 1968, P 17 50 263.5
Int. Cl. F15b 15/22
U.S. Cl. 91—401 18 Claims

A valve mechanism arranged in an operating piston slidable within a cylinder, in which the operating piston is provided with a valve channel forming a guide portion,

and a valve pin axially displaceable in the guide portion which includes a center section adapted to be guided and



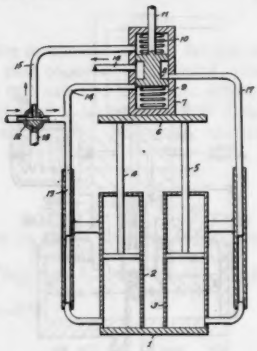
sealed pressure-tight in the guide portion and end sections of reduced cross section with respect to the center section.

3,608,434

DUAL AREA HYDRAULIC ACTUATOR

Benny M. Hillberry, West Lafayette, Ind., assignor to the United States of America as represented by the Secretary of the Army

Filed Jan. 13, 1970, Ser. No. 2,617
Int. Cl. F15b *11/16*
U.S. Cl. 91—411R 2 Claims



A plurality of fluid cylinders and pistons are connected to a source of fluid under pressure, and are cross-connected to one another through valving, such that the piston-cylinder arrangement is extended at a rapid rate of travel to push a force-exerting rod. When this rod meets a high resistance load a valve is shifted, automatically, to increase the force output while the piston-cylinder and rod advances at a reduced rate of travel.

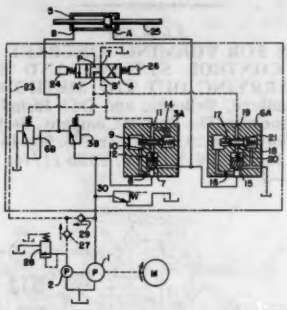
3,608,435

PRESSURE CONTROLLED DIRECTIONAL SYSTEM

Raymond S. Conabee, Prospect Heights, and Melville E. Lawrence, Arlington Heights, Ill., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed June 30, 1969, Ser. No. 837,854
Int. Cl. F15b *11/08*
U.S. Cl. 91—454 12 Claims

A pressure controlled directional system for a hydraulic press motor characterized in the provision of a motor reversing valve assembly including two supply valves and two return valves which are closed when pilot pressure is conducted thereto and which are opened by fluid pressure when pilot pressure is vented therefrom, and a four-way pilot valve which selectively conducts pilot pressure to said valves and vents pilot pressure therefrom thus to actuate the press motor in opposite directions. The pilot valve is characterized in that it has a neutral position whereat all of said valves have pilot pressure vented therefrom so that they may open to conduct system pressure to the reservoir and whereat the pilot pressure inlet port thereof is blocked so that pilot pressure stands at the pilot valve preparatory to conduction to selected supply



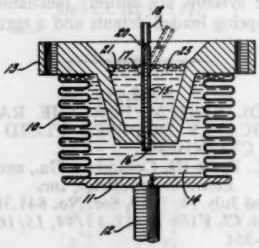
and return valves. The system herein is further characteracterized in that the supply and return valves are spring-biased against the direction of flow of fluid therethrough and in that it has a dual pump arrangement to provide for rapid actuation of the press motor in either direction by the conjoint flow of fluid from a high pressure-low volume pump and a low pressure-high volume pump.

3,608,436

BELLOWS DAMPER UNIT

Gerald F. Ostroot, St. Cloud, and Robert H. Torborg, Cold Spring, Minn., assignors to DeZurik Corporation, Sartell, Minn.

Filed May 2, 1968, Ser. No. 726,089
Int. Cl. F16j *3/00*
U.S. Cl. 92—34 3 Claims



A liquid-filled force damper unit is described in which a spring metal bellows unit is vacuum-filled with damping fluid to eliminate all air bubbles, and provided with a frangible seal. The unit is assembled to a reservoir which is filled with damping fluid above the level of the seal, which is then broken off, and a relatively flexible reservoir diaphrag.n is added to allow the unit to be used in any position.

3,608,437

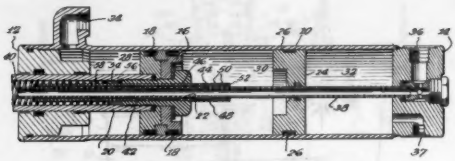
CUSHIONING DEVICE FOR HYDRAULIC MOTOR

William E. Little, West Burlington, and Robert M. Barton, Burlington, Iowa, assignors to J. I. Case Company

Filed Dec. 30, 1969, Ser. No. 889,255
Int. Cl. F01b *11/02*
U.S. Cl. 92—85 8 Claims

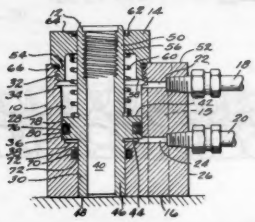
A cushioning device in a hydraulic cylinder for decelerating the movement of a piston as it approaches the head of the cylinder. The cushioning device includes a

flow control sleeve having a plurality of metering apertures therein, the sleeve being mounted on either the piston or the head and adapted to be slidably engaged by the surface of a bore formed in the piston as the piston approaches the head, the surface of the bore progressively



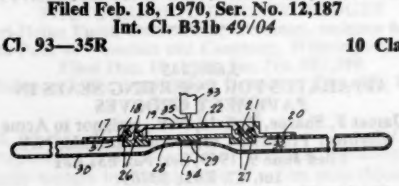
closing the metering apertures to restrict the flow of fluid and decelerate the piston. The configuration of the flow control sleeve is such that it is readily adaptable for use in a cylinder having an adjustable head for varying the length of the cylinder to effect adjustment of the stroke of the piston.

3,608,438
RECTANGULAR BODY RAM
Vitas T. Thomas and Robert A. Lovdahl, Racine, Wis., assignors to Tomco, Inc., Racine, Wis.
Filed May 13, 1968, Ser. No. 728,859
The portion of the term of the patent subsequent to May 12, 1987, has been disclaimed
Int. Cl. F01b *31/00*
U.S. Cl. 92—163 **8 Claims**



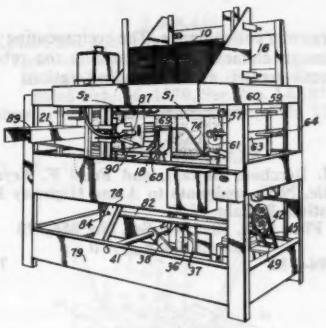
Disclosed herein is a work holding assembly including a hydraulic device having a solid or hollow ram mounted for reciprocal motion within a rectangular housing with a piston head on said ram positioned in sealing engagement with a bore in the housing. Fluid flow passages in the walls of the housing enter the bore at points out of the path of motion of said piston head and a mounting surface is provided on the housing in a plane perpendicular to the axis of the ram.

3,608,439
METHOD OF MAKING A FLEXIBLE PILFER PROOF CLOSURE CONSTRUCTION FOR BAGS
Steven Ausnit, 124 E. 61st St., New York, N.Y. 10021
Filed Feb. 18, 1970, Ser. No. 12,187
Int. Cl. B31b *49/04*
U.S. Cl. 93—35R **10 Claims**



Method of making bags each with a reclosable opening wherein a sheet of heat sealable material is formed into a split tube, and the split of the tube is covered with a closure strip which is subsequently secured thereto to form a closed tube, the closure strip containing three webs with interlocking rib and groove elements disposed on all three webs with said elements placed between the center of the strip and the extreme marginal edges, and containing two preformed tear lines between said interlocking elements and then having the webs of the closure strip heat sealed at the center of the closure strip and finally securing the tube in the heat sealed area.

3,608,440
MACHINE FOR OPENING SHIPPING CASES FROM THE FLAT
Donald G. Reichert, Tarpon Springs, and Earl Petrikin, St. Petersburg, Fla., assignors to ABC Packaging Machine Corporation, Largo, Fla.
Filed Sept. 17, 1969, Ser. No. 858,626
Int. Cl. B31b *1/62, 1/80, 5/02*
U.S. Cl. 93—36.3 **11 Claims**

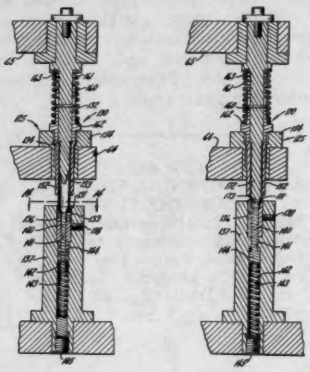


A device for opening collapsible shipping cases, closing the foldable flaps thereof, and gluing the flaps in a closed position including a magazine for receiving the cases in a flat, collapsed condition, a stripper for displacing cases individually from the magazine, a vacuum assembly for opening each case while vertically moving the same, a folding assembly for closing the end flaps of the opened case, an indexing assembly for advancing each opened case with the end flaps thereof folded closed, a glue applicator for applying adhesive to the closed end flaps, another folding assembly for closing the side flaps of each case over the glued end flaps thereof, and a sealing assembly for pressing the end and side flaps together in a closed position until the adhesive sets.

3,608,441
METHOD FOR FORMING INSIDE TAMPON APPLICATOR TUBES
Carl W. Johnson, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Feb. 3, 1969, Ser. No. 795,904
Int. Cl. B31f *7/00;* **B31b** *1/44, 1/94*
U.S. Cl. 93—94 FC **10 Claims**

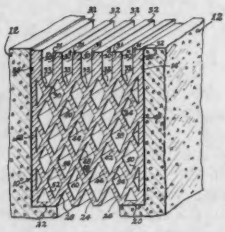
Thin-walled paper tube blanks are supplied by a feeder mechanism to a tube orienting and loading station where they are individually and successively loaded in respective ones of a plurality of collets resiliently mounted on an indexable turntable to be acted on substantially simultaneously by a set of forming elements carried on a member reciprocally mounted to advance and retract to and from tube engaging positions during dwell periods of the turntable. The tubes are gently held by the collets with a very light force fitting action which prevents distortions

to the tubes during the forming operations. One end of the tube is crimped and folded inwardly in the general shape of a truncated cone and the other end is formed



with an inwardly rolled flange. The reciprocating member also carries an element for discharging the tubes from their respective collets at an unloading station.

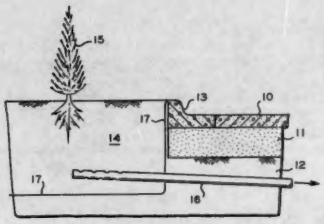
3,608,442
SEALING MEMBER
William J. Berchou, Buffalo, and Freel F. Bryan, Williamsville, N.Y., assignors to Acme Highway Products Corporation, Buffalo, N.Y.
Filed Sept. 10, 1969, Ser. No. 856,770
Int. Cl. E01c *11/10*
U.S. Cl. 94—18 **7 Claims**



An elongated resilient sealing member comprising side walls, a bottom wall and a series of elongated tread members constituting a top wall. The interior of the seal is provided with a plurality of interconnected cross bars formed integrally with the walls to provide an internal truss structure. Spaces are provided between the tread members to allow movement of the tread members into such spaces during lateral compression of the side walls. In a preferred form the spacing between adjacent tread members approximates or exceeds the width of the tread members, and each intermediate tread member is connected to a pair of downwardly diverging cross bars each having a width approximately one-half that of the tread member.

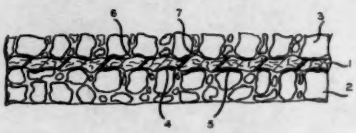
3,608,443
PROTECTION OF ROADBEDS FROM WATER SEEPAGE
Duane W. Gagle and Homer L. Draper, Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed May 26, 1969, Ser. No. 827,660
Int. Cl. E01c *9/00*
U.S. Cl. 94—22 **5 Claims**

An impermeable membrane is attached to the sides of the paving laid upon a roadbed and extends downwardly and outwardly underneath the soil adjoining the paving to prevent water from seeping into the roadbed. The membrane can extend down underneath several feet of earth and, in some instances, depending upon the contour of the



adjoining soil it may be desirable to lay drain conduits underneath the road surface to drain any water which may seep underneath the lower part of the membrane and under the paving.

3,608,444
PAVEMENT LAYING OR PATCHING WITH AGGREGATE, FABRIC, AND ADHESIVE
Dale F. Levy and Richard J. Bennett, Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed July 14, 1969, Ser. No. 841,427
Int. Cl. E01c *21/00*
U.S. Cl. 94—22 **1 Claim**

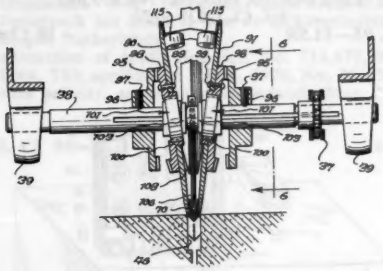


A fabric is laid upon a layer of intentionally rough surface of, say, aggregate or earth, adhesive, e.g., asphalt, is applied to wet the fabric and the aggregate or other surface and then the fabric is covered with additional aggregate in a manner to stress or stretch at least portions thereof between the interpositioned or interlocking pieces or points of the two layers of aggregate. The thus laid composite can be further covered with adhesive as by spraying and then rolled. In one embodiment, wrinking and bubbing of the fabric containing composite, as in a road surface or patch, is prevented. A fabric now preferred to be used and which has presented the wrinkling and bubbling problem is one made of a heat sealed nonwoven polyolefin fabric, e.g., polypropylene.

3,608,445
APPARATUS FOR INSERTING SEALS IN PAVEMENT GROOVES
James F. Sharpe, Buffalo, N.Y., assignor to Acme Highway Products Corporation, Buffalo, N.Y.
Filed June 9, 1969, Ser. No. 831,621
Int. Cl. E01c *23/09*
U.S. Cl. 94—39 **8 Claims**

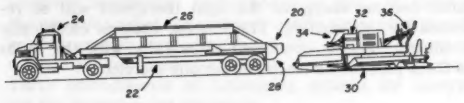
This disclosure relates to apparatus for accurately inserting elastomeric sealing material in strip form into pavement grooves for the purpose of forming tight seals between adjacent slabs of pavement to exclude foreign

material from the grooves and including a pair of rotary compression disks arranged at an angle to each other and which compress the sealing material laterally thereof



while above the groove, and an inserting wheel which moves the sealing material from the compression disks into the groove.

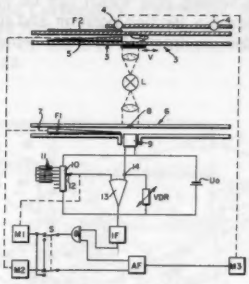
3,608,446
MATERIAL DELIVERY SYSTEM
Robert Dale Plant, Murfreesboro, Ark., assignor to Arkansas Rock and Gravel Company, Murfreesboro, Ark.
Filed Aug. 22, 1969, Ser. No. 852,350
Int. Cl. E01c *19/00*
U.S. Cl. 94—39 **19 Claims**



Hot asphalt transported to paving machines in a fleet of semi-trailers. Each trailer comprises a V-shaped hopper having bridging members extending across it for reducing asphalt packing in the hopper. Heat ducts extend through the structural me nbers of each trailer for use in preheating the hopper. Each trailer includes a conveyor for unloading the asphalt from the hopper to a paving machine. During unloading, the conveyor is controlled from the paving machine. This assures the delivery of asphalt at the proper rate and prevents the unloading of asphalt when the trailer and the paving machine are separated.

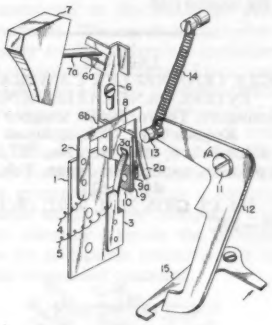
3,608,447
APPARATUS AND PROCESS FOR PRODUCING PHOTOGRAPHIC DENSITY WEDGES
Karl-Heinz Furst, Gotzenhain, Germany, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 10, 1969, Ser. No. 883,790
Claims priority, application Germany, Dec. 19, 1968, P 18 15 583.4
Int. Cl. G03
U.S. Cl. 95—1 **4 Claims**

Apparatus and process for producing photographic density wedges by illumination of a film strip through an exposure wedge which is moved with the strip past an illumination slit and a densitometer with a linearization component. In one switch position, the wedge and strip are moved in synchronism with constant velocity, and in a second position only the strip moves at such velocity past the slit, and the position of the exposure wedge in front of the slit and the densitometer is controlled in



accordance with the density produced on the first exposed sample.

3,608,448
EXPOSURE METER SWITCH FOR CAMERA
Tadayuki Imai, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Feb. 26, 1970, Ser. No. 14,287
Claims priority, application Japan, Feb. 27, 1969, 44/17,527
Int. Cl. G03b *17/00*
U.S. Cl. 95—10C **2 Claims**

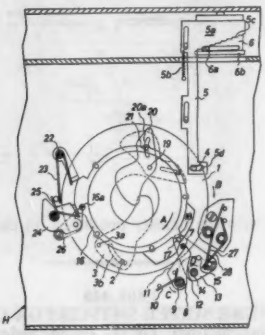


An exposure meter switch for cameras wherein a first switch which is opened or closed in response to the actuation of a selection member for selecting either an automatic exposure setting or a manual exposure setting and a second switch which is closed in response to the film winding and is automatically opened in response to the shutter release operation are connected in series to a circuit of an exposure meter.

3,608,449
EXPOSURE CONTROL FOR PHOTOGRAPHIC APPARATUS
Gunter Fauth, Unterhaching, Horst Guthke, Munich, and Willi Schulz, Schwenningen (Neckar), Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed June 19, 1970, Ser. No. 47,808
Claims priority, application Germany, June 27, 1970, G 69 25 596.5
Int. Cl. G03b *7/14, 9/22, 9/62*
U.S. Cl. 95—10C **10 Claims**

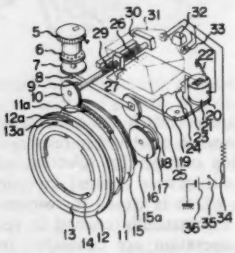
An exposure control for still cameras wherein the needle of a moving-coil instrument is scanned by a mov-

able scanning member which is coupled to a first ring for diaphragm vanes to adjust the aperture size as a function of scene brightness. The shutter blades are coupled to a second ring which can be propelled by an impeller to leave a starting position and to thereby open the blades for an interval of time which depends on



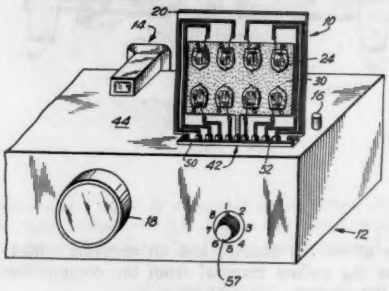
the extent of movement of the second ring from its starting position. Such extent is determined by the first ring by way of a timer cam which is biased against a pin of the first ring and has a cam face extending into the path of movement of an arresting lever which is pivoted by the second ring.

3,608,450
SINGLE LENS REFLEX CAMERA WITH INTERCHANGEABLE LENS
Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Feb. 6, 1969, Ser. No. 797,109
Claims priority, application Japan, Feb. 17, 1968, 43/11,621
Int. Cl. G03b *7/04, 9/02, 19/12*
U.S. Cl. 95—10C **5 Claims**



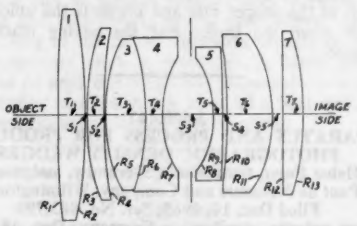
Apparatus for mounting interchangeable lenses on a single lens reflex camera with a built in exposure meter which measures the light that has passed through the photo taking lens. Two signal members connected to the lens are rotatable with the diaphragm ring of the lens. One of the signal members communicates directly with the F stop readout mechanism of the camera. The other signal member is displaced a predetermined distance from the first signal member to engage the exposure meter of the camera and thereby actuate mechanisms within the camera to compensate for the optical characteristics of each interchangeable lens. The F stop indicating mechanism in the camera and the mechanism to compensate the exposure meter work independently of each other.

3,608,451
STRUCTURE FOR EXPOSING PHOTOGRAPHIC FILM WITH FLASH ILLUMINATION
Lester S. Kelem, 1480 Rte. 46, Apt. 150A, Parsippany, N.J. 07054
Filed Sept. 18, 1969, Ser. No. 859,035
Int. Cl. G03b *9/70*
U.S. Cl. 95—11.5R **10 Claims**



A structure to be used with cameras for making flash exposures. The structure includes an electrically non-conductive sheet, such as a sheet of cardboard, in front of which a plurality of flashbulbs are located adjacent to a surface of this sheet. A plurality of conductors are carried by the sheet at this latter surface thereof and are electrically connected to the flashbulbs, respectively. Also, a light-reflecting coating is carried by this surface of the sheet between the latter and the bulbs so that as the latter become energized the light therefrom will be reflected by this coating. The coating itself is electrically conductive and is connected electrically with the bulbs to form part of the electrical circuits thereto.

3,608,452
2× CRT RECORD AND DISPLAY LENS
Lawrence H. Conrad, Rochester, N.Y., and David C. Gilkeson, North Oaks Village, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 16, 1968, Ser. No. 768,075
Int. Cl. C03b *29/00*
U.S. Cl. 95—12 **2 Claims**



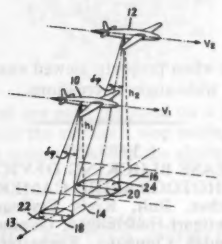
A display-print module for viewing and recording images from a small cathode-ray tube. The module includes a fast, high resolution magnifying projection lens with a large relative aperture for use in projecting images from a cathode ray tube to a rear projection screen or film plane. The lens has a large element near the tube to gather light with good correction for the lens.

3,608,453

DEVICE FOR TERRAIN PHOTOGRAPHY BY MEANS OF SCANNING SYSTEMS

Huibert J. Dirksen, The Hague, and Arie N. de Jong, 's Gravenzande, Netherlands, assignors to Nederlandse Organisatie voor Toegepast-Natuurwetan-Schappelijk Onderzoek ten Behoeve van de Rijksverdediging, The Hague, Netherlands

Continuation of application Ser. No. 714,475, Mar. 20, 1968. This application July 1, 1970, Ser. No. 51,451
Claims priority, application Netherlands, Mar. 29, 1967, 6704503
Int. Cl. G03b *29/00*
U.S. Cl. 95—12.5 6 Claims



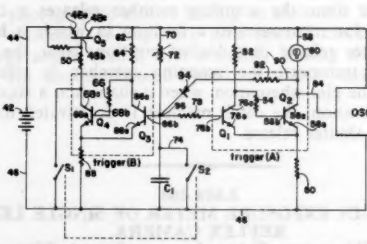
In airborne equipment for surveying terrain, in particular by infrared photography, which includes a mirror rotating at a constant speed to scan the terrain in a series of parallel strips extending transverse to the line of flight of the aircraft and apparatus for projecting the images thus obtained onto a moving film, the improvement of apparatus for varying the field of view of the scanning mechanism proportional to the *v/h* ratio of the aircraft so that the scanned terrain strips abut to yield a photographic reproduction of the terrain having no omitted portions and substantially no duplicated portions. Three embodiments of defocusing systems for carrying out the invention are described.

3,608,454

IMBIBITION INTERVAL TIMER AND ANNUNCIATOR

Edwin K. Shenk, Littleton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed June 27, 1968, Ser. No. 740,518
Int. Cl. G03b *17/52*
U.S. Cl. 95—13 20 Claims



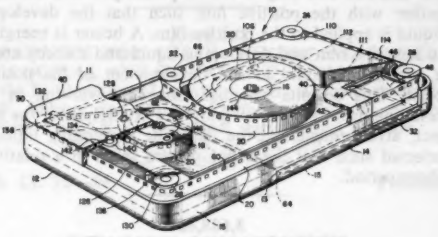
A timer-annunciator system for use with photographic cameras of the self-developing variety. The device functions to energize a warning light continuously during the film developing-imbibition process interval and to sound an audible alarm at the conclusion of the interval. Following the audible alarm, the electronic circuitry of the system is automatically de-activated.

3,608,455

SYSTEM FOR PROCESSING A STRIP OF PHOTOGRAPHIC MATERIAL

Rogers B. Downey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 4, 1969, Ser. No. 813,469
Int. Cl. G03b *17/50;* G03d *13/08*
U.S. Cl. 95—13 22 Claims



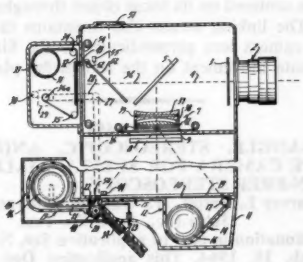
A motion picture film processing system employing a dispensing container having an applicator through which processing fluid may be expressed onto a strip of exposed photographic material as the strip of material is drawn thereacross. Processing fluid is initially stored in a collapsible container having a weakened portion adapted to rupture responsive to a predetermined compressive force. A fluid feeding device communicates with a reservoir chamber of the dispensing container through an exit orifice provided in one of its walls and also has an entrance port connected to the weakened portion of the collapsible container. The reservoir chamber is at least equal in capacity to the collapsible container. This system can advantageously be employed in a compact multipurpose film handling cassette, having a removable cover plate adjacent the collapsible container-fluid feeding device, which is adapted to be mounted both within a camera and a unique processor-projector unit. With the aforesaid cover plate removed, a roller of the processor-projector unit progressively applies a compressive force against the entire length of the collapsible container-fluid feeding device assembly whereby the processing fluid is expelled from the collapsible container into the reservoir chamber of the dispensing container.

3,608,456

INSTANT DEVELOPED PRINT IN DUAL METHODS CAMERA

Allan H. Hauser, 12635 Gremoor Drive, Elm Grove, Wis. 53122

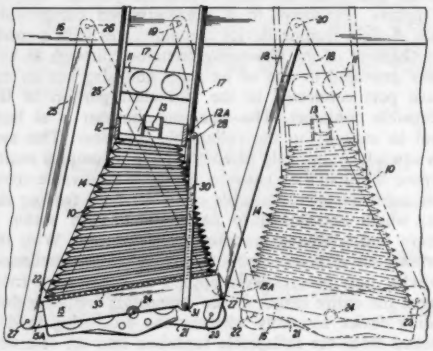
Filed May 28, 1969, Ser. No. 828,639
Int. Cl. G03b *35/08*
U.S. Cl. 95—18 4 Claims



The disclosure includes a portrait camera having a beam splitter for directing the image of the subject onto

a relatively small negative and simultaneously onto a substantially larger positive in combination. The negative film and the positive film are simultaneously moved through the camera in stepped relation for taking of sequential pictures. The positive film is held in a cartridge including a developing unit and is withdrawn through the developing unit. The developing unit includes a roll of a dry strip plastic and means to apply a developing liquid to the surface. The strip is driven past a pressure roller together with the positive film such that the developing liquid is applied to the positive film. A heater is energized to heat the film and developing liquid and thereby create a rapid, direct and in situ development of the positive print. This permits essential immediate viewing of the resulting proof picture for purposes of analysis of the subject, arrangement and the like. The developing liquid is selected such that the proof picture fades in a relatively short period.

3,608,457
PHOTOGRAPHIC APPARATUS
Hunter P. Barker, Larchmont, N.Y., assignor to Commercial Decal, Inc., Mount Vernon, N.Y.
Filed July 10, 1969, Ser. No. 840,659
Int. Cl. G03b *35/08*
U.S. Cl. 95—18 **7 Claims**

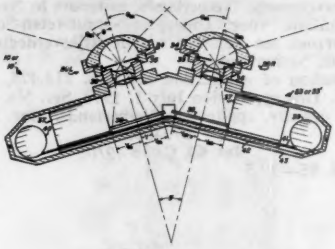


A novel three-dimensional photographic apparatus which is light, compact and readily portable to a photographic location. The device comprises a camera and a mounting therefor, the mounting being designed to move the camera through an arc of a continuous radius while maintaining the optical axis of the camera lens at all times perpendicular to the vertical axis of the film.

The camera is mounted on a carriage which is in turn mounted pivotally on a carriage mount which is linked by a series of lever arms to a supporting platform such that when moved through an arcuate path, the camera remains centered on its focus object throughout the movement. The linking means also maintains the optical axis of the camera lens perpendicular to the film throughout its arcuate movement on the supporting platform.

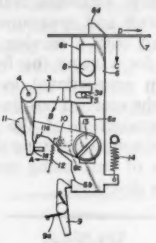
3,608,458
WIDE-ANGLE, STEREOSCOPIC, AND FISHEYE-TYPE CAMERA FOR SUBSTANTIALLY DISTORTION-FREE STEREOSCOPY
Harvey L. Ratliff, Jr., Waldorf, Md., assignor to Jetru Inc., Amarillo, Tex.
Continuation-in-part of application Ser. No. 343,841, Feb. 10, 1964. This application Dec. 10, 1968, Ser. No. 782,672
Int. Cl. G03b *35/08*
U.S. Cl. 95—18 **7 Claims**

A wide-angle, stereoscopic, and fisheye-type camera for panoramic stereo re-creations utilizing fisheye lenses which preferably have diverging optical axes for taking



pictures which when properly viewed enable substantially distortion-free wide-angle re-creations.

3,608,459
RELEASE BLOCKING DEVICE FOR PHOTOGRAPHIC CAMERAS
Helmut Ettischer, Ruit, Kreis Esslingen, and Alfred Trumpp, Stuttgart-Hedelfingen, Germany, assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 21, 1968, Ser. No. 777,730
Claims priority, application Germany, Dec. 8, 1967, K 59,652
Int. Cl. G03b *19/04*
U.S. Cl. 95—31FL **5 Claims**

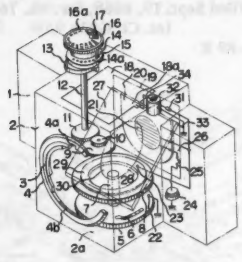


A release blocking device for photographic cameras or the like, in which a photographic film strip, perforated at predetermined intervals, is advanced stepwise along a predetermined path. A scanning member is arranged to engage and disengage successive perforations on the photographic film. At or during shutter actuation, the scanning member becomes disengaged from a perforation, thus permitting film transport to take place. At the same time, the scanning member releases a catch member for movement to a position in which it holds the shutter release in a locked position. Near the end of film transport, the scanning member is released toward the film whereupon, when it snaps into a succeeding perforation, the catch member is deactivated to unlock the shutter release.

3,608,460
BUILT-IN EXPOSURE METER OF SINGLE LENS REFLEX CAMERA
Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan
Filed Feb. 24, 1969, Ser. No. 801,433
Claims priority, application Japan, Feb. 29, 1968, 43/15,480
Int. Cl. G03b *7/00, 19/12*
U.S. Cl. 95—42 **5 Claims**

A single lens reflex camera having a built-in exposure meter and having the limited space due to the necessarily large housing for the rotatable mirror utilizes the space

at the bottom of the camera, between the bottom wall of the camera and the bottom wall of the mirror housing, for the location of the variable resistor and its cooperable brush contact in the circuit of the exposure meter. The



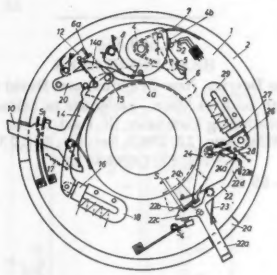
resistor and brush are each mounted on a gear. One gear is cooperable with the camera's stop setting member and the other gear is cooperable with the shutter speed setting member.

3,608,461

PHOTOGRAPHIC SHUTTER WITH ELECTRONIC TIMING DEVICE AND AN ELECTRONIC TIME CONTROL DEVICE FOR SELF-TIME PHOTOGRAPHS

Winfried Espig, Calmbach, Schwarzwald, Germany, assignor to Prontor-Werk Alfred Gauthier G.m.b.H., Calmbach, Schwarzwald, Germany

Filed July 22, 1968, Ser. No. 746,500
Claims priority, application Germany, July 26, 1967, P 15 97 358.7
Int. Cl. G03b *9/64*
U.S. Cl. 95—53.3 **9 Claims**



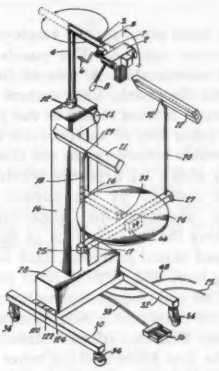
A photographic shutter having an electronic timing device including an exposure time control circuit with a battery and a branch with a shutter locking electromagnet. An electromagnetic open-time shutter lock for the shutter drive and an electronic delay device is connected to the shutter lock to temporarily lock the shutter action after release. The electronic delay device has a switching device operable at the end of the delay period to connect the electromagnet of the exposure time control circuit to the battery. The switching device is in the form of an electronic switch connected to the branch of the exposure time control circuit that includes the shutter locking electromagnet.

3,608,462

APPARATUS FOR USE IN RECORDING PATHOLOGICAL AND SURGICAL INFORMATION

David L. Groshong, Los Altos, Calif., assignor to Bruce W. Stilson, San Rafael, Calif., and Guy W. Shoup, New York, N.Y., fractional part interest to each

Filed Apr. 4, 1963, Ser. No. 270,614
Int. Cl. G03b *17/56*
U.S. Cl. 95—86 **1 Claim**

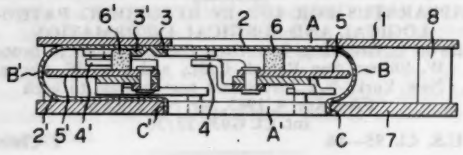


1. A camera stand for use in medical photography comprising a housing containing a vertically positioned receiving tube for a camera support arm on which is mounted a tripod head, said receiving tube having in it a thumbscrew and handle enabling positioning of the camera support arm at any elevation desired, said housing also containing a vertically positioned threaded rod, said threaded rod extending through an arm on which is mounted a camera object platform, the rotation of said threaded rod causing the vertical movement of said camera and object platform, said rotation being effected by a motor and drive assembly at the base of said housing controlled by a foot switch, with the distance from a camera on said tripod head to said camera object platform being measured by telemeter apparatus rigged in the camera stand.

3,608,463
CAMERA SHUTTER

Takeo Yamada, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Dec. 9, 1968, Ser. No. 782,047
Claims priority, application Japan, Dec. 8, 1967, Dec. 8, 1967, Dec. 8, 1967, 42/78,515; 42/78,516; 42/78,517
Int. Cl. G03b 9/28
U.S. Cl. 95—57 8 Claims

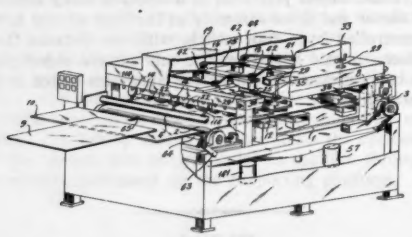


A high speed focal plane shutter employs two panels each having an exposure aperture. The panels are arranged in spaced parallel relationship. A pair of flexible curtains is disposed between the panels. Each curtain is U-shaped. One end of each curtain is fixed to one of the panels, or the first panel, and the other end of each curtain is connected to a mouthpiece movable between open and closed positions, that is, the positions where the exposure aperture is respectively uncovered and covered by the curtain. A pair of link mechanisms is provided for respectively moving the mouthpieces along the inner surface of the other or second panel to open and closed positions. Each link mechanism includes a driving lever and a driven lever pivotally connected to each other. One end of each driving lever is pivoted on the first panel and the other end is slidably connected to one end of a mouthpiece. One end of each driven lever is slidably connected to the first panel and the other end is pivoted to the opposite end of the mouthpiece.

3,608,464
APPARATUS FOR DEVELOPING LITHOGRAPHIC PLATES

Robert E. Harrell; Arthur E. Essmueller, and Roy C. Bax, all of St. Louis County, Mo., assignors to Western Litho Plate & Supply Co., St. Louis, Mo.

Filed May 14, 1968, Ser. No. 729,040
Int. Cl. G03d 5/00
U.S. Cl. 95—89R 10 Claims

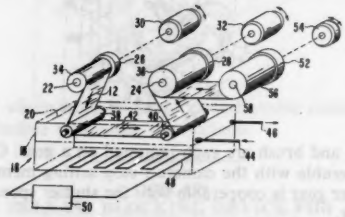


Apparatus for postexposure treatment of lighographic plates having an endless belt on which such a plate is transported successively to, through, and beyond, a development station, a washing station, and a preserving station. The plate is rubbed at some of the treating stations by a rubbing device after having treating liquid deposited thereon. The plate undergoing treatment is held fast on the endless belt by interfacial tension.

3,608,465
MAT FILM PRODUCT AND PROCESSING APPARATUS AND METHOD THEREFOR

Franklin K. Ching, Mt. View, and Harry N. Dieffenbach, Fremont, both of Calif., assignors to Mark Systems, Inc., Santa Clara, Calif.

Filed Sept. 17, 1968, Ser. No. 760,312
Int. Cl. G03b 9/00
U.S. Cl. 95—89 R 6 Claims

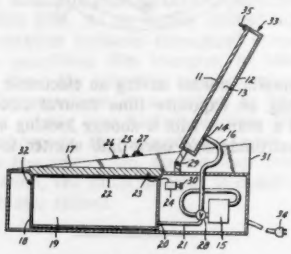


A mat film product of the Bimat type wherein the product, after it has been presoaked or imbibed, is provided with a protective cover film on the emulsion side thereof. Apparatus for utilizing the imbibed product in the processing of photographic film includes structure permitting the removal of the cover film from the product immediately before it engages the photographic film to be processed yet allows the same cover film to be again applied to the product after the film processing step has been completed. The method of handling the product includes applying the cover film after imbibing the product, removing the cover film before processing the photographic film, and applying the cover film to the product after the film processing step.

3,608,466
HEAT DEVELOPER

Richard Alan Devries, New Brighton, and David C. Dornberg, Mahtomedi, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 22, 1969, Ser. No. 852,230
Int. Cl. G03d 13/00
U.S. Cl. 95—89 R 1 Claim



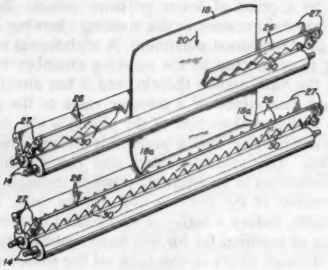
Apparatus for uniformly developing a light-exposed sheet of radiation-sensitive heat-developable film on a heating platen which assures uniform film contact with the heated surface and uniform heat transfer and development. The developer has a pivotably mounted transfer platen which initially receives the exposed sheet material and retains it thereon by use of an air pump. A valve mechanism controls the air pressure to the transfer platen and is operated to subsequently position the sheet material on a heating platen.

3,608,467

GUIDE MEMBER FOR SHEETS OF PHOTOGRAPHIC PRINT PAPER

Gerald Marvin Rouff, Dayton, Ohio, assignor to Technology Incorporated, Dayton, Ohio

Filed Apr. 9, 1969, Ser. No. 814,686
Int. Cl. G03d 3/12
U.S. Cl. 95—94 R 5 Claims



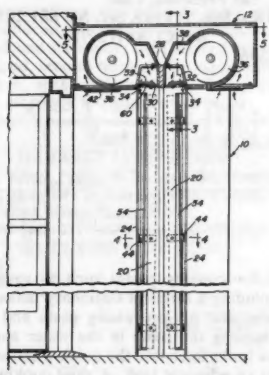
A guide member which guides a sheet of photographic print paper to a position between two juxtapositioned rotating rollers which move the sheet of paper through a liquid. The guide member has a part provided with spaced-apart portions which permit circulation of the liquid. The spaced-apart portions have converging surfaces so that they do not restrain the movement of the sheet of paper.

3,608,468

ADJUSTABLE AIR-CURTAIN SYSTEM

Cloise M. McClurkin, 1821 North St. S. E., Decatur, Ala.

Filed Aug. 15, 1969, Ser. No. 850,591
Int. Cl. F24f 9/00
U.S. Cl. 98—36 8 Claims



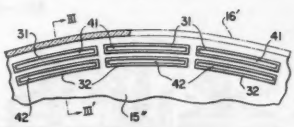
An air-curtain installation incorporating a pair of independent duct systems positionable in slightly spaced adjacent parallel orientation to each other and oriented so as to define two separate diverging air curtains. Each system includes its own power-driven blower and is supplied with air drawn solely from the side to which the corresponding curtain is directed. Each duct system also includes adjustable vanes or baffle plates utilized particularly along the vertical sides of the ducts so as to selectively vary the amount of air discharged thereby at the upper and lower end of the sides for an accommodation of varying temperature conditions. The entire system is preferably prefabricated into three basic units, a pair of opposed sidewalls incorporating the side duct portions therein, and an overhead blower housing incorporating the horizontal duct portions which interlock with the side duct portions upon an assembly of the three units.

3,608,469

APPARATUS FOR THE REMOVAL OF DEWDROPS FROM A DEWED PLATE MEMBER

Norio Mutoh, and Kenji Fuuikake, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyoto Chuo Kenkyusho, Nagoya-shi, Aichi-ken, Japan

Filed May 12, 1970, Ser. No. 36,537
Claims priority, application Japan, May 12, 1969, 44/44042
Int. Cl. B60l
U.S. Cl. 98—2.09 2 Claims



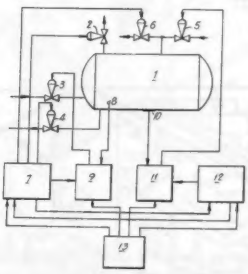
This invention relates to improvements in and relating to an apparatus for the removal of accumulated dewdrops on a plate member, such as automotive front or windshield glass, mirror surface, gauge board or the like, by use of a hot airblast distributed over the dewed surface of the plate member. The apparatus according to this invention is characterized by the provision of a plurality of parallel rows of elongated blasting air-nozzle openings separated a lateral distance from each other, for the delivery of airblasts arranged in layers towards the glass surface.

3,608,470

SYSTEM FOR AUTOMATIC CONTROL OF PROCESS OF BOILING, VACUUM COOLING AND DEHYDRATION OF FOOD STUFFS

Vyacheslav Petrovich Zabiyakin, ulitsa Krasnokamennaya, 26b, kv. 2; Lev Ivanovich Abramian, pereulok Severny, 9, kv. 7; Alexander Pavlovich Anisimov, ulitsa Sergeeva, 27, kv. 2; Oleg Ivanovich Nikishin, pereulok Serverny, 5, kv. 15; Ljudmila Dmitrievna Saranova, Leninsky prospekt, 90, kv. 18, and Tatyana Konstantinovna Berends, Maly Kakovinsky pereulok, 6, kv. 9, Moscow, all of U.S.S.R.

Filed Nov. 3, 1969, Ser. No. 873,306
Int. Cl. A47d 27/00
U.S. Cl. 99—246 22 Claims



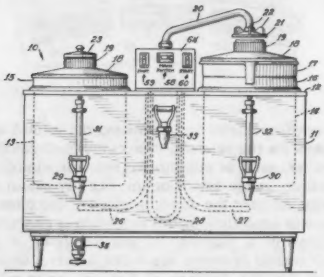
A system for automatic control of the processes of boiling, vacuum cooling, draining a condensate and dehydration of foodstuffs, preferably meat and fish in a chamber employed for treating the foodstuffs, comprises a control unit for sending control signals during time intervals, a circuit for prescribing the program of vacuum cooling and dehydration connected to the control unit, a unit for controlling the temperature of boiling the food stuffs connected to the control unit, an actuating mechanism controlled by the control unit

and connecting the chamber with the atmosphere, an actuating mechanism for draining off condensate from the chamber controlled by the control unit and an actuating mechanism for controlling the temperature connected to the temperature control unit. The system is fully automatic and utilizes further control means for accomplishing the above-said function.

3,608,471
SAFETY START SWITCH SYSTEM FOR COFFEE URN HAVING A SWING SPOUT

John C. Martin, Springfield, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed July 28, 1970, Ser. No. 58,927
Int. Cl. A47j *31/00*
U.S. Cl. 99—283 **3 Claims**

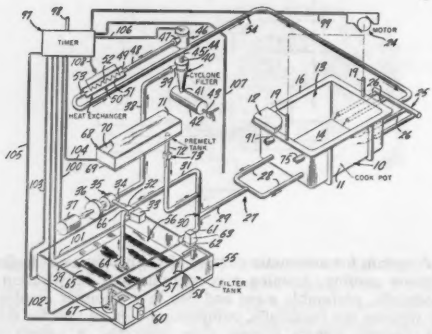


In order to encourage inspection of the position of a swing spout of a coffee urn to observe whether it is in position to discharge hot water into one or the other of a pair of coffeemaking receptacles, two series connected start switches are located on opposite sides of the swing spout, require simultaneous closure to start a pump to supply hot water to the swing spout, and are closed by the use of both hands of the operator.

3,608,472
PRESSURIZED COOKING SYSTEM

Arthur F. Pelster; William L. Parker, and Donald D. Modglin, all of Nashville, Tenn., assignors to Kentucky Fried Chicken Corporation, Louisville, Ky.

Filed June 5, 1969, Ser. No. 830,844
Int. Cl. A47j *27/62*
U.S. Cl. 99—327 **15 Claims**

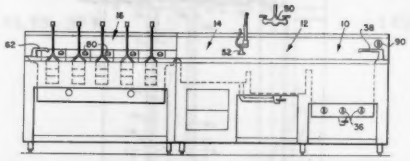


A pressurized cooking system for frying food, such as chicken parts, in a bath of hot liquid, such as fat. This system includes in a closed recirculating circuit a closable and sealable cooking pot chamber for removable reception of food pieces to be fried in the bath therein, a pump and heat exchanger means, with suitable piping connecting these units in series and isolating the interiors thereof and the circuit from the surrounding atmosphere during the cooking cycle. The recirculating liquified fat is pooled at elevated pressure in the cooking chamber to a limited elevation that permits the food for cooking to be immersed in the pooled bath while providing a liquid free head space thereabove. A valved steam vent is connected directly to this head space for venting steam to a point of lower pressure outside the system when the internal pressure in the cooking chamber increases beyond a predetermined maximum. A withdrawal section of the piping is connected to the cooking chamber below the surface of the bath pooled therein, and it has direct connection through one intake of a selector valve to the pump intake. This withdrawal section of the piping is also connected through a drain valve into a preferably heated filtering and storage tank. The selector valve also has another intake which is connected in an alternate position through a passage into the bottom of the filtering and storage tank. This tank serves initially, before a series of succeeding cooking cycles, as a source of liquified fat for the recirculating circuit to be delivered through filters in this tank nd the selector valve to the pump intake and also, after a cooking cycle is completed, as a receiver and storage of hot liquified fat that is drained from the cooking chamber. When the heat exchanger is of the electrically energized type its heat source heaters preferably are mounted in the hot liquified fat pumped therethrough. This heat exchanger is associated with a flow switch unit with the electrical circuit switch embodied therein being connected into the electrical circuit which energizes the heaters, so that if the flow is below a predetermined minimum or ceases this switch opens to shut off the energizing current to the heaters. The drain valve serves as a liquid blowdown valve.

3,608,473
APPARATUS FOR COOKING SPAGHETTI AND SIMILAR PASTES

Joseph J. Kearn, San Francisco; Jerome A. Solomon, Millbrae; Richard M. Pearson, San Mateo, and Henry B. Booth, Redwood City, all of Calif., assignors to Luigi's Spaghetti Shack, Inc., San Francisco, Calif.

Filed Dec. 1, 1969, Ser. No. 881,203
Int. Cl. A47l *27/12*
U.S. Cl. 99—336 **5 Claims**



Apparatus for cooking pastes such as spaghetti in large quantities including a series of stationary tanks or vessels for retaining water and for processing paste and having metal baskets for holding the paste in the water and hinged with respect to the tanks to enable the quick transfer of the basket contents into an adjacent tank. A final cooking before serving is accomplished in one of several small baskets which are immersed in boiling water for an automatically timed brief period.

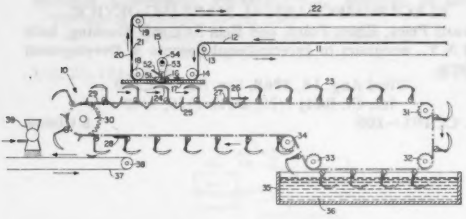
3,608,474
APPARATUS FOR PREPARING CHIP-TYPE PRODUCTS

Alexander L. Liepa, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 683,083, Oct. 31, 1967, abandoned, Continuation-in-part of application Ser. No. 569,278, Aug. 1, 1966. Filed July 14, 1969, Ser. No. 862,557
Int. Cl. A23
U.S. Cl. 99—353 **6 Claims**

Method and apparatus for continuously preparing fried products from a sheet of edible dough including an infeed

conveyor to carry the sheet of dough; a cutter for cutting pieces the desired size from the sheet; a shaper-molder utilizing movable, apertured mold halves to shape the cut pieces to the desired surface conformation and hold them during

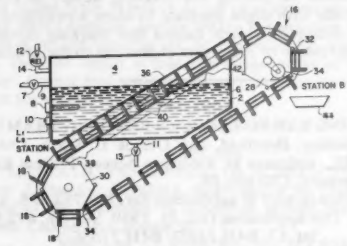


subsequent processing; and a reservoir containing a frying medium through which the shaped, restrained pieces are passed until they are fried to a crisp state. The fried objects assume a final shape defined by the shaper-molder.

3,608,475
APPARATUS FOR CONTINUOUSLY COOKING A PRODUCT

Douglas R. Scott, 24 Susquehana Court, Elkhart, Ind., and Kenneth G. Kreuter, 3309 S. Maine, Goshen, Ind.

Filed Apr. 2, 1970, Ser. No. 25,026
Int. Cl. A23b *3/00*
U.S. Cl. 99—362 **8 Claims**

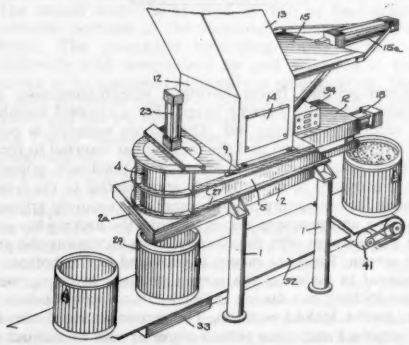


Apparatus for continuously cooking a product whereby the product is introduced into a pressurized chamber containing a heated liquid and its vapor, then moved sequentially first through the liquid, second through the vapor, and thence out of the chamber, with sealing means being provided for preventing the escape of the liquid or its vapor.

3,608,476
GARBAGE COMPACTOR

Howard Price, Kings Point, N.Y., and Seymour D. Wallick, Clifton, N.J., assignors to International Patents & Development Corporation, Kings Point, N.Y.

Filed June 27, 1969, Ser. No. 837,143
Int. Cl. B30b *13/00, 15/16*
U.S. Cl. 100—35 **19 Claims**

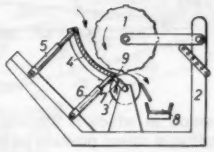


A garbage compactor has a compacting chamber into which garbage, including refuse is compacted by a ram, after which the garbage is ejected into a portable container. A hydraulic and electrical operating and control system permits the compactor to operate without constant attendance by an operator.

3,608,477
ROLL PRESS

Paul Weber, Karlsruhe-Waldstadt; Ignaz Daferner, Karlsruhe; Bertram Botsch, Karlsruhe, and Joachim Dittirch, Karlsruhe, all of Germany, assignors to Maschinenfabrik H. Geiger, Karlsruhe, Germany

Filed Mar. 27, 1969, Ser. No. 811,125
Claims priority, application Germany, Mar. 27, 1968, Oct. 12, 1968, Oct. 12, 1968, Jan. 18, 1969, P 17 52 050.2;P 18 02839.2;P 18 02 843.8;P 19 02 530.0
Int. Cl. B30b *3/02*
U.S. Cl. 100—156 **6 Claims**

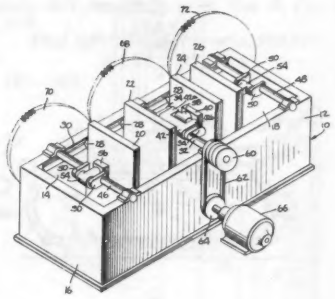


A roll press, particular for pressing raked material in sewage disposal plants, comprises an adjustable feed chute for guiding the material to be pressed into a wedge-shaped nip formed by an upper press roll and a portion of the chute.

3,608,478
HIGH-SPEED PRESS

Bernard L. Hoffman, Trenton, N.J., assignor to Frederick A. Krause Associates, Inc., Frenchtown, N.J.

Filed Apr. 16, 1970, Ser. No. 29,196
Int. Cl. B30b *15/04, 15/14*
U.S. Cl. 100—209 **8 Claims**



Press mechanisms comprising a frame mounting at least two pairs of press shoes which are actuated by crankarms; and mechanical or electrical synchronizing means for operating the press shoes in alternate sequence.

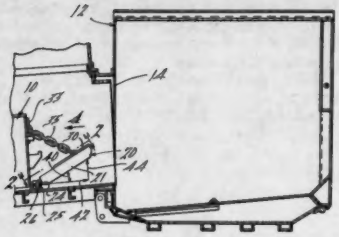
3,608,479
COMPACTION LOADING APPARATUS

Robert J. Pioch, Jackson, Mich., assignor to Kysor Industrial Corporation, Cadillac, Mich.

Filed Feb. 3, 1969, Ser. No. 796,059
Int. Cl. B30b *15/06*
U.S. Cl. 100—229 **4 Claims**

Apparatus for loading and compacting material in a receptacle includes a ram moving in a rectilinear path and means

for lifting the work as the ram moves into engagement with it, consisting of a rigid lifting member formed as a relatively flat rectangular frame pivoted to the front of the ram on a transverse horizontal axis and swingable upwardly from an



initial lowered position in which it inclines upwardly at a relatively small angle to a raised position to which it is urged by a resolution of the reactive forces between the ram and the work.

3,608,480

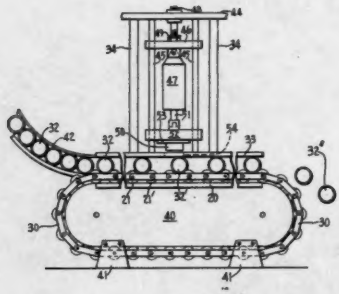
HOT STAMPING AND HEAT TRANSFER PRESS FOR ROLLABLE OBJECTS

Tony Sciame, Linden, N.J., assignor to Patent Development Corporation, Linden, N.J.

Continuation-in-part of application Ser. No. 689,224, Nov. 20, 1967, now abandoned , Continuation-in-part of application Ser. No. 553,397, May 27, 1966, now abandoned. This application Feb. 17, 1970, Ser. No. 12,065

Int. Cl. B44c *1/14;* **B41f** *17/22*

U.S. Cl. 101—7 **4 Claims**



A press for hot stamping or heat-transferring an image upon a rollable object comprises a rigid bottom surface on which are rolled, in gripping relation, at least one pair of similar resilient spaced rollers carrying end-projecting shafts. The object is grippingly rolled between these rollers for imprinting the image thereon. A movable chain disposed on each side of the rolls has slotted bearings in which ride the projecting shaft ends, thus enabling the shaft ends to move vertically but not horizontally. A rigid unheated upper surface is disposed over the rollers in a manner to be capable of applying a vertical downward pressure on the rolled objects. A heated die is disposed within the upper surface, and a foil carrying thermoplastic ink or transfer is disposed between the object and the die for transferring the image onto the object as it is rolled under the die.

3,608,481

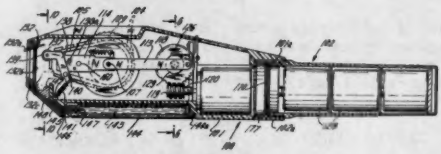
ELECTROMECHANICAL MARKING DEVICE

Howard Price, Kings Point, and Bela Szilagyi, Flushing, both of N.Y., assignors to International Patents & Development Corp.

Filed Aug. 16, 1968, Ser. No. 753,290

Int. Cl. B41j *1/20;* **B41k** *1/10, 1/40*

U.S. Cl. 101—108 **5 Claims**



An electrically operated marking device for stamping articles repeatedly with preset characters. Marking of an article is accomplished be placing the marking device in contact with the article with slight pressure to close a switching contact. The closing of switch causes the marking device to apply an impression of the preset characters to the article.

3,608,482

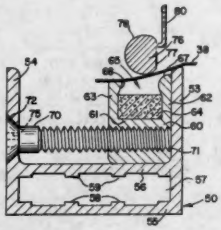
LOCKING BAR FOR SCREEN-PRINTING FRAME

Henry J. Bubley, Deerfield, and Claude H. Oltra, Chicago, both of Ill., assignors to American Screen Process Equipment Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 752,023, Aug. 12, 1968. This application Oct. 31, 1969, Ser. No. 872,957

Int. Cl. B41l *13/02;* **B41f** *27/04*

U.S. Cl. 101—127.1 **3 Claims**



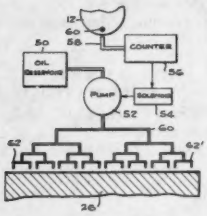
A screen-printing frame having a screen-tensioning arrangement including a frame supporting a channel member which receives a locking bar. The screen material is positioned over the channel and the locking bar inserted to force the screen into the channel where it is positively gripped. Means is provided to move the channel relative to the frame to provide for tensioning after the screen is securely gripped. The tension on the screen serves to move the locking bar into tighter engagement with the channel, thus increasing the grip on the screen. Resilient means is provided in the bottom of the channel to maintain the screen material in engagement with the locking bar during initial insertion and rotation of the bar to the locked position. The screen material may be easily removed and other screen material with or without an image installed.

3,608,483

INKING SYSTEM WITH MEANS FOR MILLING HYDROPHOBIC LIQUID INTO WATER MISCIBLE INK FILM

Bernard Kaminstein, Paramus, N.J., assignor to Inc. C. Olivette & C. S.p.A., Ivrea, Italy

Filed Mar. 14, 1969, Ser. No. 807,325
Int. Cl. B41f 7/32, 7/36
U.S. Cl. 101—148 2 Claims



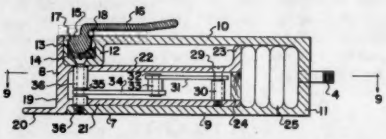
An inking system is provided for a duplicating master, of a type wherein the nonimage portions are selectively repellent to water- or glycol-based inks and the image portions accept water or glycol-based inks. The water-based ink is applied to the printing rollers of a printing press, in the usual manner. A small quantity of a hydrophobic liquid is dropped on one roller of the train of rollers of the printing press, ahead of the roller which directly applies ink to the printing master. This liquid is milled into the ink by the rolling action of the rollers. The end result is that the image areas of the printing master accept that water-based ink and the nonimage areas reject the water-based ink.

3,608,484

PNEUMATIC TENSIONING OF SCREEN STENCILS

Henry J. Bubley, Deerfield, and Claude H. Oltra, Chicago, both of Ill., assignors to American Screen Process Equipment Company, Chicago, Ill.

Filed Aug. 12, 1968, Ser. No. 751,916
Int. Cl. B41l 13/02; B41f 27/04
U.S. Cl. 101—127.1 6 Claims



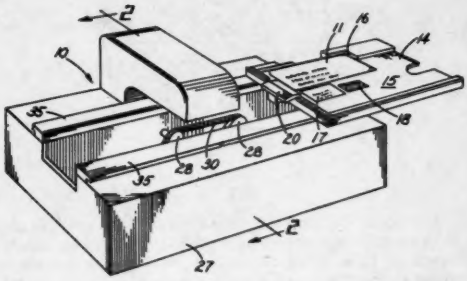
In the preparation of screen process stencils, a stencil frame is enclosed tightly by a pneumatically operated frame. The stencil screen is secured on two or four sides on the movable portions of the surrounding pneumatic tensioning frame. The pneumatic tensioning frame is then inflated uniformly with compressed air and extended to cause the screen to be tensioned uniformly in all directions. The screen is then tacked or stapled or otherwise fastened to the stencil frame and has the desired degree of stretch for stencil printing. The pneumatic tensioning frame comprises a plurality of pneumatically operated frame members having a fixed member engageable with the stencil frame and a movable member on which the stencil screen is secured for movement under pneumatic pressure. The pneumatic frame members are provided with a mechanical linkage for ensuring that the members maintain a parallel relation during movement under pneumatic pressure to prevent the frame from separating further at one end than at the other when only part of the frame is being used to tension a screen stencil. The movable portion of the pneumatic frame has a normal fabric locking arrangement comprising an elongated slot having a narrow necked opening and a rotatable cam lock bar for securing fabric in place.

3,608,485

CLIPBOARD DATA RECORDER

Erwin F. C. Schulze, Novelty, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Jan. 13, 1969, Ser. No. 790,785
Int. Cl. B41f 3/04
U.S. Cl. 101—269 1 Claim



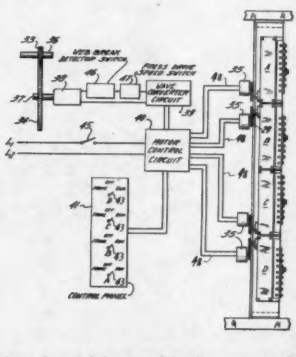
A printing machine with a separable portable tray and a roller platen. The tray has a clip to hold a form set by one edge and allow the other edge to extend without restraint. The tray serves as a common reference plane for a separable printing plate and variable data wheels both carried by the tray.

3,608,486

DRIVE MEANS FOR THE INKING MECHANISM OF A PRINTING MACHINE

John J. McDonald, Park Ridge, N.J., and Ralph L. Fusco, Commack, N.Y., assignors to R. Hoe & Co., Inc., New York, N.Y.

Filed Apr. 28, 1969, Ser. No. 819,847
Int. Cl. B41f 31/28
U.S. Cl. 101—365 13 Claims



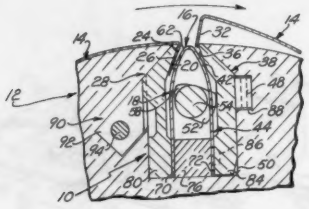
A mechanism for driving multiunit pumps of an inking mechanism in a printing machine using a signal-sending device to transmit electrical pulse signals, in response to rotation of the press drive shaft, to a motor control circuit, which in turn operates stepping motors to drive an ink pump including remote control means for selectively operating any such unit. An entire pumping unit can be electrically turned on or off to meet various pumping requirements as called for by different operating conditions.

3,608,487

FLEXIBLE PLATE CLAMPING ASSEMBLY INCLUDING INWARDLY BOWED SPRING AND MOVABLE JAW

Hans J. Luehrs, Westerly, R.I., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed Aug. 27, 1969, Ser. No. 853,305
Int. Cl. B41f *27/12*
U.S. Cl. 101—415.1 13 Claims



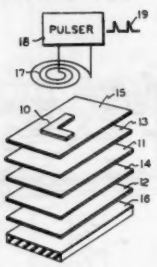
An improved clamp assembly for securing a printing plate or other printing element on a cylinder includes an inwardly bowed or bent spring element. A movable jaw presses the spring element toward a clamping surface to grip or clamp a leading end portion of the printing plate between the surface and one side of the spring element. A trailing end portion of the printing plate is gripped or clamped between the movable jaw and the opposite side of the spring element. To maintain a substantially constant tension in the printing plate and to compensate for elongation of the printing plate, a longitudinally extending wave spring presses the movable jaw toward the inwardly bowed spring element with a substantially constant predetermined force. A cam assembly is selectively operable to release the printing plate.

3,608,488

PRINTING AND REPRODUCING PROCESS

Alfred B. Levine, 2924 Terrace Drive, Chevy Chase, Md.

Division of Ser. No. 575,474, Aug. 26, 1966, Pat. No. 3,486,449, Continuation of application Ser. No. 304,176, Aug. 23, 1963, now abandoned. Filed May 25, 1970, Ser. No. 40,123
Int. Cl. B41m *5/00*; B44b *5/00*; G01d *15/12*
U.S. Cl. 101—426 9 Claims



An electrical process for simultaneously printing one or more copies of an image from a master applied in the form of a pattern of electrical conductors, e.g. a printed circuit, a pattern of magnetized areas, or a pattern of electrostatic charged areas wherein the patterns are operated upon by a remote electrical or magnetic field creating a force pattern on a pressure sensitive marking medium to transfer dye or color markings onto one copy or plural copies simultaneously. The force pattern may be amplified or enhanced by applying a current directly to the pattern of conductors to electrodynamically react with the field.

3,608,489

PLANOGRAPHIC PRINTING PLATE

John Henry Croker, Broxbourne, England, assignor to Gestetner Limited, London, England

Filed June 2, 1967, Ser. No. 643,066
Claims priority, application Great Britain, June 14, 1966, 26445/1966
Int. Cl. B41n *1/00, 3/00*
U.S. Cl. 101—462 9 Claims

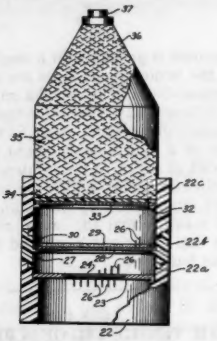
Planographic printing plates capable of withstanding long printing runs are made by coating a support with a reaction product of a water-soluble urea- or melamine-formaldehyde resin and a water-soluble colloid containing free acid groups.

3,608,490

POROUS MATERIALS

John D. O'Keefe, Seal Beach, Calif., assignor to North American Rockwell Corporation

Filed Oct. 20, 1967, Ser. No. 676,819
Int. Cl. B23p *3/09*
U.S. Cl. 102—24 4 Claims



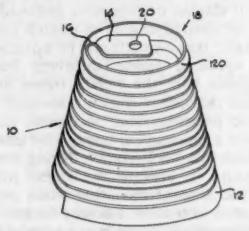
Energizing of materials having a high degree of porosity by passing a high energy shock therethrough is described. Much of the energy of the shock is inelastically converted to thermal energy of the porous material thereby greatly increasing its temperature and pressure. The hot, high pressure material is used for welding two solid bodies together in one embodiment and in another is employed to accelerate a plate to high velocity. Multiple layers of such porous material having low density alternating with high density layers with monotonic changes in thickness of both sets of layers provides an amplification of pressure of a shock for accelerating a plate to very high velocity.

3,608,491

TAMPING PLUG

Vernon Jan Botes, Johannesburg, Republic of South Africa, assignor to Dunaplug (Proprietary) Limited, Pietersburg Transvaak Province, Republic of South Africa

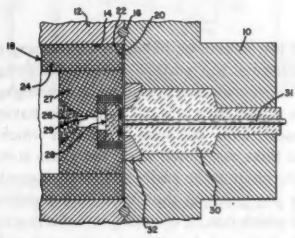
Filed Dec. 26, 1968, Ser. No. 787,161
Claims priority, application South Africa, Dec. 27, 1967, 671-7731
Int. Cl. F42d *1/08*
U.S. Cl. 102—30 10 Claims



The invention provides for a plug for use in blasting holes, the plug consisting of substantially rectangular section

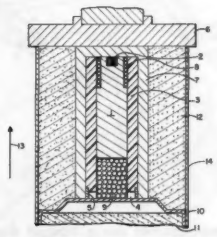
striplike material formed into a cone-shaped spiral member in which the convolutions overlap one another and having their larger faces diverging in the direction of the small end of the member.

3,608,492
AMMUNITION HIGH-VOLTAGE ELECTRICAL IGNITION SYSTEM
James W. Mitchell, Philadelphia, Pa., assignor to General Electric Company
Filed Oct. 2, 1969, Ser. No. 863,076
Int. Cl. F42b *5/08, 5/18*
U.S. Cl. 102—38 **6 Claims**



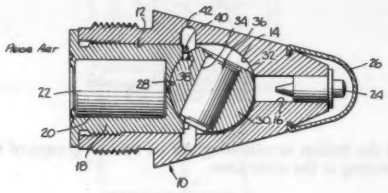
An electrical ignition system for ammunition that utilizes two fixed electrical contacts in the bolt face; and a primer having an electrically conductive priming mix, and a consumable dielectric disc having two annular consumable conductors therethrough, the gap between the two conductors being significantly greater than twice any gap between the bolt face and the disc, the ignition system being completed and energized by a high-voltage power source of sufficient voltage to overcome any airgap between the cartridge and the bolt face.

3,608,493
FUSE APPARATUS
Robert L. Aske, and Thomas E. Carlson, both of Hennepin, Minn., assignors to Honeywell, Inc., Minneapolis, Minn.
Filed Apr. 10, 1969, Ser. No. 814,920
Int. Cl. F42c *15/28*
U.S. Cl. 102—78 **3 Claims**



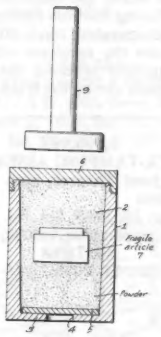
A fluid barrier, delay arming, safing and arming mechanism utilizing a barrier material having flow characteristics to separate a detonator and acceptor explosive. The fuse is armed by causing the barrier material to flow out of its "safe" position between the detonator and acceptor explosive in a predetermined arming environment such as spin and/or setback. The invention provides a barrier material which may be used for safing as well as for determining a delay associated with arming.

3,608,494
TIME DELAY FUSE
Richard T. Ziemba, Burlington, Vt., assignor to General Electric Company
Filed Mar. 5, 1969, Ser. No. 804,443
Int. Cl. F42c *9/02, 7/00, 9/00*
U.S. Cl. 102—79 **5 Claims**



A time delay fuse has a ball rotor carrying the detonator charge in a bore along the axis of mass symmetry, and normally held safe, out of line by a detent clip. Release of the clip requires both adequate set back force and centrifugal force. Once the rotor has rotated into the armed, in-line disposition, it is interlocked in this disposition.

3,608,495
APPARATUS AND METHOD FOR ENCAPSULATING FRAGILE COMPONENTS
Baltzar Leo De Mare, Aberdeen, Md.
Filed June 23, 1969, Ser. No. 835,674
Int. Cl. B65d *85/42*
U.S. Cl. 102—92.6 **3 Claims**

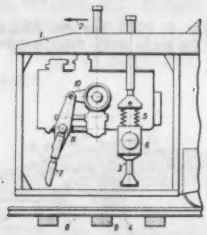


A fragile article, such as an electronic component being used in a rocket or military projectile vehicle, is embedded in a powder to minimize vibrations, shock and heat effects and to render the packaged article easy of removal for inspection or replacement.

3,608,496
BALLAST TAMPING APPARATUS
Ludwig Schenkir, Perchtoldsdorf, and Josef Dultinger, Innsbruck, both of Austria, assignors to Franz Plasser Bahnbaumaschinen, Vienna, Austria
Filed June 6, 1969, Ser. No. 831,060
Claims priority, application Austria, June 11, 1968, Feb. 25, 1969, A5577/68;1908/68
Int. Cl. E01b *27/16*
U.S. Cl. 104—12 **3 Claims**

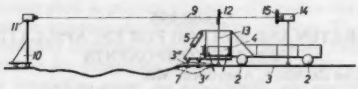
Solidly compacted ballast support for a railroad track is

produced by simultaneously tamping the ballast under a tie



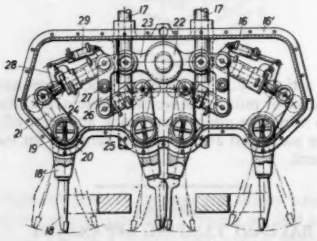
and the ballast surrounding the tie by two groups of tampers operating at the same time.

3,608,497
TAMPING AND LEVELLING MACHINE
Franz Plasser, and Josef Theurer, both of Johannesgasse 3, 1010 Vienna, Austria
Filed Feb. 25, 1969, Ser. No. 802,157
Claims priority, application Austria, Mar. 7, 1968, A2238/68
Int. Cl. E01b *27/17, 29/04*
U.S. Cl. 104—7 R **11 Claims**



In a mobile track tamping and levelling machine, the reference system includes a beam transmitter and a pair of beam receivers associated with one or both track rails. A pair of masking boards is associated with the receivers for masking a portion of the beam, the respective upper and lower edges of the boards facing towards each other and preferably being aligned. Fluid-operated track-lifting means is controlled by signals from the receivers which depend on the beam portion or intensity received thereby as the boards enter into the beam path during the track-lifting operation.

3,608,498
TRACK-TAMPING ASSEMBLY
Franz Plasser, and Josef Theurer, both of Johannesgasse 3, 1010 Vienna, Austria
Filed Apr. 28, 1969, Ser. No. 819,664
Claims priority, application Austria, Apr. 29, 1968, A4171/68
Int. Cl. E01b *27/16*
U.S. Cl. 104—12 **13 Claims**

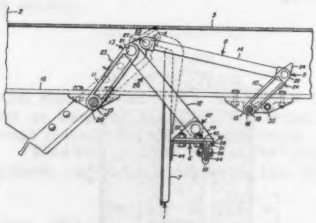


A track-tamping assembly including a pair of opposed, vibratory and reciprocable tamping tools is mounted on a vertically adjustable carrier, and a transmission lever is mounted on the carrier independently of the tamping-tool-vibrating means to link the upper ends of the tamping tools to the vibrating means.

3,608,499
TOW CHAIN FOR CONVEYORS
Robert Krammer, Farmington, Mich., assignor to Rapistan Incorporated, Grand Rapids, Mich.
Filed July 18, 1969, Ser. No. 843,137
Int. Cl. F16g *13/06*
U.S. Cl. 104—172 C **25 Claims**

A chain of low silhouette having links forming a relatively smooth, continuous top surface except for certain spaced links which incorporate a recessed truck-pin-engaging notch. The links are joined by a vertical joining pin having opposed shoulders spaced from the ends of the pin which positively maintains the links assembled while the chain is in operation yet permits the chain to be easily and safely assembled or disassembled at any point in the chain. The combination provides a chain which can be operated in a shallow track within the floor. The links can be utilized to form a conventionally driven main chain. A slave chain can be driven from the main chain by either a freewheeling dog extending under both chains, engaged by both the driving chain and the slave chain, or by a dog welded to the underside of the slave chain and engaged by the underside of the main chain.

3,608,500
TANDEM TOGGLE HOPPER DOOR OPERATING MECHANISM
Walter L. Floehr, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Sept. 11, 1968, Ser. No. 758,927
Int. Cl. B61d *7/18;* **B11d** *7/26;* **B61d** *7/28*
U.S. Cl. 105—240 **14 Claims**



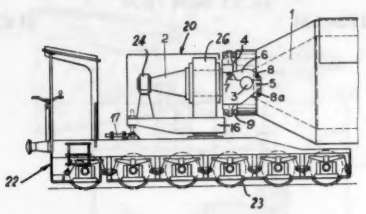
An operating mechanism for a hinged door or a railway hopper car having a manually or motor operated drive linkage providing in closed position a plurality of locks in tandem against opening of the door and in an opening operation a quick release permitting the door to swing open by gravity beyond a vertical position, while decreasing the resultant movement of an actuating member, the linkage conveniently being mountable on and swingable in a center sill of the car and for manual operation having an operating shaft fitted with one or more automatically releasing operating heads coacting with the reduced movement of the actuating member for preventing injury to an operator.

3,608,501

HOT METAL TANK CAR

Werner Marxen, Duisburg, and Werner Trost, Duisburg-Wanheimerort, both of Germany, assignors to Demag AG, Duisburg, Germany

Filed Aug. 19, 1968, Ser. No. 753,686
Claims priority, application Germany, Oct. 19, 1967, D 54385
Int. Cl. B61d 5/04, 9/02, 9/08
U.S. Cl. 105—270 8 Claims



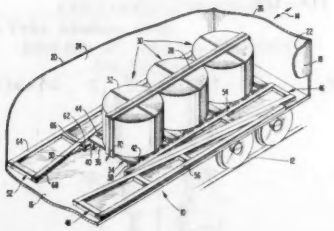
An apparatus for holding and transporting a hot metal mixer tank in a metallurgical plant includes a platform car having wheels for running over a trackway and a support at each end for removably engaging a large hot metal mixer. The hot metal mixer tank is supported on axle or tilt axle mounted at each end of the carriage. Each pivot axle includes at least two arms which carry bearing shells on each side of the associated end of the mixing tank. The mixing tank carries transversely extending horizontal position pins which extend outwardly from each side and rest in the open top bearing shells. The tops of the shells may be closed by pivotal cover plates which are bolted in position when closed. The supporting pivot axles on the track car also carry upper and lower rigid extensions having adjustable back pressure bolt members which may be threaded inwardly or outwardly in order to provide a longitudinal bearing pressure against the end surface of the mixing tank when the latter is oriented in position on the bearing journals and the side bearing pins are locked in the open shell supports.

3,608,502

CONTROLLED-FLOATING LADING

Hans F. Wegener, Michigan City, Ind., assignor to National Steel Corporation

Filed Dec. 26, 1968, Ser. No. 787,016
Int. Cl. B60p 7/16; B61d 45/00
U.S. Cl. 105—369 B 6 Claims



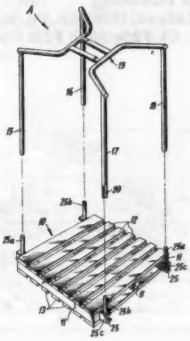
Controlled-floating lading arrangement in which a wedge system blocks heavy lading against upstanding support surfaces in a freight conveyance. Shifting of the lading incident to quick stops or starts of the conveyance, which would snap rigid moorings, is permitted, but controlled within safe limits by friction between lading and wedges. The wedge system is adjustable for conveyances or loads of different sizes, and is reusable.

3,608,503

DETACHABLE MOUNTING DEVICE FOR PALLET-TIERING FRAMES

Robert L. Marcheso, Flanders, N.J., assignor to Stor-Dynamics Corporation, Paterson, N.J.

Filed July 10, 1970, Ser. No. 53,748
Int. Cl. B65d 19/18
U.S. Cl. 108—53 5 Claims



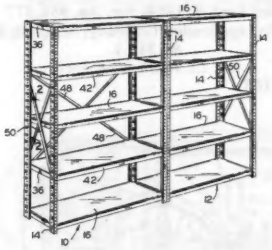
A pallet-tiering frame having two opposed pairs of spaced vertical posts carrying a top member therebetween at their upper ends is detachably mounted to a pallet by telescopically slidably engaging the vertical frame posts with guide rods secured to the opposite ends of each of a pair of elongated bar members which are slidably received between the deck boards of the pallet and positioned adjacent to the outer stringers thereof. Each pair of guide rods is spaced apart a distance approximately equal to the length of the pallet stringers so as to extend upwardly immediately adjacent the associated corners of the pallet and to restrain movement of the bar members when installed.

3,608,504

KNOCKDOWN SHELF STRUCTURE

Walter R. Peters, 3922 S.W. 55th Drive, Portland, Oreg.

Filed June 2, 1969, Ser. No. 829,671
Int. Cl. A47b 57/08
U.S. Cl. 108—109 1 Claim



A plurality of sheet metal shelves are detachably connected at their corners to cornerposts made of metal members by shelf-supporting clips. A plurality of vertically extending and vertically spaced open-ended sockets are provided on the inner surface of one angle member of each post. The clips each have a downwardly extending lower end portion received in one of the sockets, an intermediate horizontal extending shelf-supporting portion and an upwardly extending shelf holding upper end portion. The shelves each have reinforcing flanges extending downwardly from a body portion of the shelf along the ends and side edges of the shelves and the end flanges extend behind and engage the

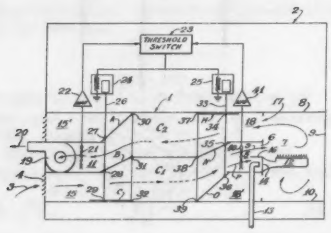
shelf-holding end portions of the clips and rest on the intermediate portions of the clips. The end flanges have inwardly displaced portions providing horizontal clearance for the sockets to enable the shelves to be installed and removed.

3,608,505

APPLIANCES EMPLOYING CHECKER-BOX REGENERATORS

Robert B. Rosenberg, Evergreen Park; Jack Huebler, Deerfield, and Esher R. Kweller, Evanston, all of Ill., assignors to Institute of Gas Technology

Filed May 4, 1970, Ser. No. 34,332
Int. Cl. F23g *3/00*; F23l *9/04*
U.S. Cl. 110—8 A **10 Claims**



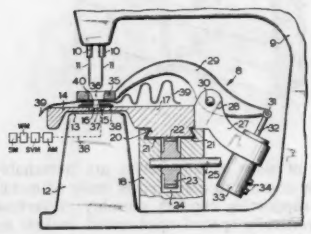
The application discloses improved checker-box-type regenerators in combination with gas-fired domestic or commercial appliances, such as home incinerators, cooking ovens, smooth top ranges, mangles and the like, employing single, double, and plenum-type heating or combustion chambers. The input ambient air is preheated as it passes through a checker-box, and is then ducted to the appliance. The hot exhaust air and gases pass countercurrent through another section of an adjacent checker-box and are thereby cooled. The cooled flue products may be vented directly into the room wherein the appliance is situated if desired, without technical or safety problems arising, codes permitting. The use of the regenerator is in accordance with a process in which the rate of heating in the appliance is controlled.

3,608,506

METHOD AND APPARATUS FOR AFFIXING A ZIP FASTENER TO A SUPPORTING ARTICLE

Friedrich Glindmeyer, Stolberg, Rheinland, Germany, assignor to Firma William Prym-Werke KG, Stolberg/Rheinland, Germany

Filed Sept. 9, 1969, Ser. No. 856,377
Claims priority, application Germany, Sept. 10, 1968, P 17 85 311.1
Int. Cl. D05b *3/04, 3/18*
U.S. Cl. 112—105 **10 Claims**



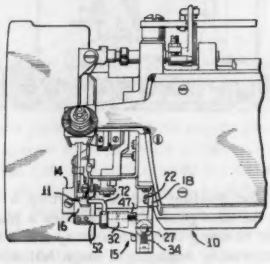
A method and an apparatus for affixing a zip fastener to a supporting article. A sewing machine is provided with a workpiece support on which an article and a zip fastener to be secured thereto may be placed. Holding means is provided for holding the zip fastener and the article in their desired relative positions during sewing, and moving means serves to move either the workpiece support with the article and zip fastener relative to the needle, or move the workpiece support and the holding means in unison, together with the zip fastener and article.

3,608,507

SHIRRING ATTACHMENT FOR SEWING MACHINES

Mario A. Cima, Buffalo Grove, and Stephen J. Stasiak, Woodridge, both of Ill., assignors to Union Special Machine Company, Chicago, Ill.

Filed June 3, 1969, Ser. No. 830,048
Int. Cl. D05b *35/08*
U.S. Cl. 112—134 **21 Claims**



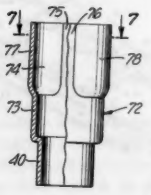
This disclosure relates to a shirring attachment for sewing machines equipped with differential feeding mechanisms, and includes a bracket pivotally carrying an arm which in turn carries a shirring blade, the arm and bracket having cooperative abutment means for locating the arm in operative and inoperative positions thereof, and biasing means for positively though releasably maintaining the abutment means in contacting engagement in both positions of the arm. The shirring blade is pivotally journaled to the arm for rotation of about a horizontal aXis, and cam and cam follower means are provided for automatically pivoting the shirring blade to an inoperative position upon the pivoting movement of the arm to its inoperative position.

3,608,508

METHOD OF MANUFACTURING LAMP SOCKET ASSEMBLIES

James N. Dupree, South El Monte, Calif., assignor to Western Indicator Co., Inc., South El Monte, Calif.

Division of Ser. No. 699,505, Jan. 22, 1968, Pat. No. 3,506,934.
Filed Jan. 12, 1970, Ser. No. 2,265
Int. Cl. B21d *53/36*
U.S. Cl. 113—119 **2 Claims**

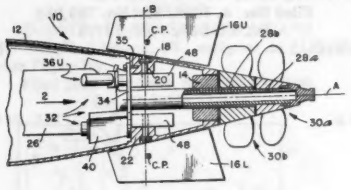


A lamp socket having a center conductor pin fixed in the insulator and socket sleeve. An additional terminal in the socket assembly adjacent the center pin for tying the wire going to the pin. A socket assembly including an illuminated panel, color filter and heat sink. A method of forming a socket sleeve for bayonet base lamps.

3,608,509
TORPEDO-STEERING CONTROL AND ROLL-STABILIZATION APPARATUS

John D. Brooks, San Gabriel, and Orrin W. Albert, Jr., Arcadia, both of Calif.

Filed Jan. 26, 1967, Ser. No. 612,305
Int. Cl. F42b *19/01, 19/06, 19/08*
U.S. Cl. 114—23 3 Claims

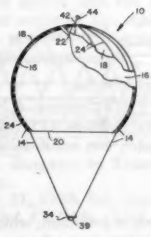


Torpedo-steering control and roll-stabilization apparatus comprising four bodily movable steering fins mounted in quadrature relationship around the tail cone with their fin shaft ends extending through the shell wall, and a unitary-actuator assembly for actuating the ends of the fin shafts. The frame of the actuator assembly is an annular ring adapted for transverse mounting across the interior of the shell ahead of the fins. The ring has a substantially square opening with the sides of the opening perpendicular to the fin shaft axes. Three upstanding lugs are affixed to the front face of the ring adjacent three of the sides of the opening. The upstanding lugs carry three identical fin actuators including a servomotor driven worm meshed with a worm wheel. The worm wheel has an aperture along its axis adapted to engage the inner ends of the fin shafts along its axis. The actuators are fastened to the lugs by adjustable means permitting alignment of the worm wheel aperture with the fin shaft prior to the actuator being secured in place. The bodily movable fins have integral fin shafts, with the fin shaft axis passing through the fin slightly ahead of the hydrodynamic center of pressure of the fin. Two diametrically opposite fins are driven independently by different actuators producing a combination joint deflection steering command and a differential deflection steering command to yield steering command and a differential deflection steering command to yield steering control in one steering plane, and yield roll control. The other steering fins are coupled by a yoke and driven by a deflection steering command yielding steering control in the other steering plane.

3,608,510
COLLAPSIBLE PONTOON

Gerrit De Vries, Altadena, Calif.

Filed Feb. 26, 1969, Ser. No. 802,529
Int. Cl. B63b *7/10*
U.S. Cl. 114—54 10 Claims

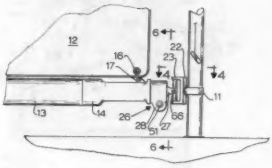


A collapsible pontoon including a flexible metal cage composed of a series of spaced-apart cables an inner inflatable gas-impervious bag disposed within the metal cage and capable upon inflation of tightly engaging the cables of said cage; and an intermediate separate porous fabric bag located between the metal cage and the inflatable bag for providing support for the inflatable bag in the spaces between the cables of said metal cage.

3,608,511
ROLLER REEF ACTUATING MECHANISM AND BRAKE

Bernard R. Katshen, c/o Famet Marine 745 2nd Ave., Redwood City, Calif.

Filed Jan. 23, 1970, Ser. No. 5,228
Int. Cl. B63h *9/04*
U.S. Cl. 114—106 7 Claims

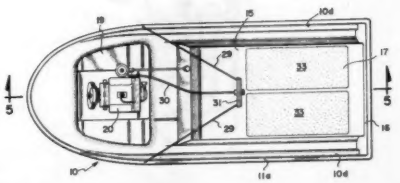


A sail may be reefed by geared roller reefing whereby the lower end of the sail is wrapped around a horizontal boom pivotally attached to a mast. A housing is attached to the mast by a universal joint connection. Within the housing is a spiral worm gear held in position by a snapring engaging grooves in housing and gear. A hexagonal shaft extends from the gear and is received in the "bottle" formed on the adjacent end of the boom. A worm in the housing is turned by a crank to turn the gear and thus the boom with a low ratio of about 11:1. The worm carries adjacent either end an O-ring which fits against a bore in the housing and the hole in a hollow nut which is threaded into the housing and the hole in a hollow nut which is threaded into the housing over the opposite end of the worm to hold the latter in place. The O-rings act as a brake to prevent reverse rotation of the boom which would otherwise occur because of the ratio and also to seal lubricant.

3,608,512
AQUAPLANE

James A. Thompson, Ogden, Utah, assignor to Warren P. Boardman, Ogden, Utah

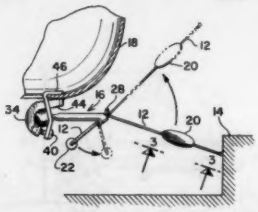
Filed Jan. 26, 1970, Ser. No. 5,664
Int. Cl. A63c *15/04*
U.S. Cl. 115—70 6 Claims



A flat-bottomed and buoyant hull has an upwardly open, longitudinally extending compartment open rearwardly at its stern, for accommodating a rider in standing position, and is provided with a pair of elongate, longitudinally extending fins of narrow, single formation laterally of and depending from the flat bottom. Each fin has its outer surface normal to the flat bottom of the hull and its inside surface merging arcuately into the flat bottom. The flat bottom is also preferably provided with longitudinally extending grooves intermediate the fins. Propulsion means is placed directly below the open rear

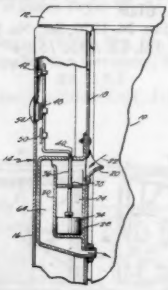
end of the compartment between the fins, and a throttle-provided, flexible hand-hold extends toward the compartment from a forward anchorage to the hull, preferably at opposite lateral sides thereof.

3,608,513
CURB GUARD FEELER DEVICE
Leonard L. Gray, 10869 Andasal Ave., Granada Hills, Calif.
Filed May 11, 1970, Ser. No. 36,247
Int. Cl. B60q
U.S. Cl. 116—28 **10 Claims**



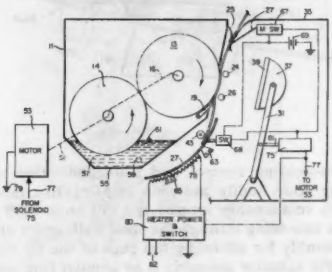
A curb guard feeler device for a vehicle having an elongated flexible feeler rod extending laterally from the vehicle. The feeler rod is provided with an airfoil member for aerodynamically elevating the rod from the rod surface when the vehicle is moving. A counterweight is provided to facilitate the elevating of the feeler rod from the road surface at low vehicle speeds. The feeler device is secured to a fender of the vehicle by means of a double action clamp which will position the feeler device at a suitable height with respect to the road surface and additionally will permit universal adjustment of the elongated rod and attached air foil member.

3,608,514
AUTOMATIC DISHWASHER INDICATOR FOR CLEANED OR SOILED DISHES THEREIN
Edward L. Dunn, 4495 Culbertson Ave., La Mesa, Calif.
Filed Apr. 3, 1969, Ser. No. 813,113
Int. Cl. G01f *23/00*
U.S. Cl. 116—118 **1 Claim**



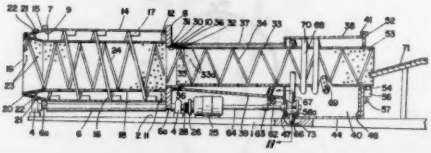
A two-state fluid tilt or position indicator in which a casing is provided with a midwall to catch dishwasher fluid during the dishwashing operation, and discharges such fluid caught within a first chamber of the casing into a second chamber, and said second chamber of the casing discharging the dishwasher fluid into the dishwasher chamber, or other exhaust means, when the door of the dishwasher is opened and tilt sufficiently forward to evacuate the fluid from said first chamber. Also provided is a float in the first chamber, the float having a stem with a diversity indication of discs thereon, and an indicator window so that one disk is presented through the window when the one chamber is containing the dishwasher fluid and the other disk is presented through the indicator window when said one chamber has been discharged of said fluid.

3,608,515
APPLICATOR FOR APPLYING PRESSURE SENSITIVE ADHESIVE AND OTHER COATING MATERIALS TO SHEET ITEMS
Philip E. Tobias, 1872, Watson Road, Pa.
Filed Dec. 4, 1968, Ser. No. 780,985
Int. Cl. B05c *1/02, 11/16*
U.S. Cl. 118—2 **10 Claims**



The present device provides a means for applying thin coatings of material to sheet items or webbing material. The invention will be described in connection with the application of a pressure-sensitive adhesive to sheet or webbing material, wherein the adhesive compound employs a solvent to keep it in a fluid state, thus enabling the adhesive to be worked without being heated. In accordance with the design principles of the present device, the adhesive mixture containing solvent is held in a reservoir and is kept from evaporating from said reservoir by employing a cover which seals the applicator member and hence the reservoir from the atmosphere which surrounds the housing, when there is no sheet material being processed. However the sealing cover is movably positioned away from the path along which the sheet or webbing material passes in contact with the applicator when the device is in use. In addition the path for the sheet material is arranged so that the "adhesive side" of the sheet is facing up as the sheet material leaves the machine, thereby enabling the user to support or carry the sheet by coming in contact with the nonsticky undersurface.

3,608,516
BREADING MACHINE
Edward F. Temple, 3934 Harris Road, Broadview Heights, Ohio
Filed June 18, 1969, Ser. No. 834,266
Int. Cl. B05c *5/00*
U.S. Cl. 118—16 **9 Claims**



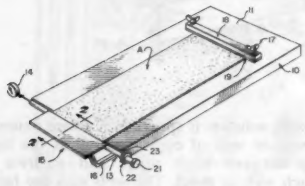
A breading machine is provided, which is characterized by simplicity of construction, ease of assembly and disassembly, and adaptability of one-man operation. Novel features include pumping means for continuously spraying the items to be breaded with an edible coating fluid which facilitates ad-

herence of the breading mixture to the items, means for continuously feeding the coated items through a shower of breading mixture, and means for continuously feeding excess breading mixture in a direction countercurrent to the direction of movement of the items which are being breaded. Auxiliary features include means enabling a single operator stationed at the delivery end of the machine to feed articles to be breaded to the entry or feed end of the machine, irrespective of the overall length of the machine.

3,608,517
SUBSTRATE-TENSIONING MEANS

Shrenik D. Shroff, Chicago, Ill., assignor to U.S. Plywood-Champion Paper Inc.

Filed June 10, 1969, Ser. No. 831,880
Int. Cl. B05c *11/12*
U.S. Cl. 118—33 **4 Claims**

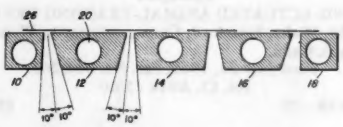


This invention relates to apparatus for coating and drying a fibrous substrate under tension comprising a platform, means at one end of said platform for holding an end of fibrous substrate stationary against said platform under constant pressure, and adjustable tensioning means at the opposite end of said platform for grasping the opposite end of said fibrous substrate for applying and maintaining tension thereon during coating and drying.

3,608,518
STATIONARY MASK FOR CONTINUOUS VAPOR DEPOSITION

Thomas A. Poole, Setauket, N.Y., assignor to Alloys Unlimited, Inc.

Filed Apr. 1, 1970, Ser. No. 24,488
Int. Cl. C23c *11/02*
U.S. Cl. 118—48 **4 Claims**



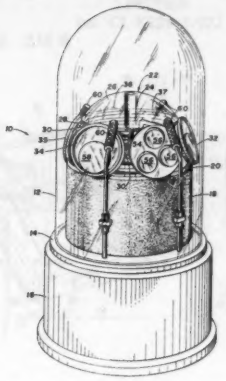
A stationary mask for depositing a strip of metal on a moving substrate is disclosed. The mask has a generally trapezoidal cross section, with an angle between the line of sight from the evaporation source and the side of the mask of about 10°. The acute angle of the mask adjacent the substrate is as sharp as possible. The mask is preferably constructed of water-cooled copper.

3,608,519
DEPOSITION REACTOR

Kenneth E. Bean, Richardson, and John R. Campion, Garland, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1968, Ser. No. 788,250
Int. Cl. B05c *11/14*
U.S. Cl. 118—48 **6 Claims**

A reactor for depositing a thin layer of material on a semiconductor slice by thermal decomposition of reactant gases is disclosed which has a circular rail, a number of disk-shaped graphite susceptors or supports each having a flat face from which projects a circular retaining rim, a member rotating on an axis extending through the circular rail for rolling the susceptors along the rail while supporting the susceptors at an inclined angle, and an RF coil for heating the susceptors as they are rolled along the rail. The edge of a semiconductor slice placed on the face of the susceptor rolls around the rim of the susceptor as the susceptor rolls. This mechanism is enclosed in a chamber and the reactant gases passed through the chamber. Thus, anomalies in the RF field

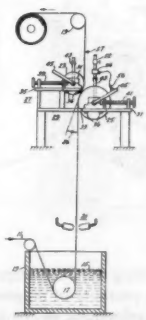


are compensated as the susceptor rolls around the rail to evenly heat the susceptor, thermal anomalies in the susceptors are compensated as the slice continually moves over the susceptor, and anomalies in the composition of the reactant stream are compensated as each semiconductor slice rotates about its own axis while being translated in a circular path through the vapor stream. Layers uniform in thickness within ±0.5 percent have been achieved, representing an order of magnitude improvement over prior art devices, with corresponding improvements in the uniformity of doping levels and resistivities.

3,608,520
COATING APPARATUS

Laurence B. Caldwell, and Robert W. Helman, both of Bethlehem, Pa., assignors to Bethlehem Steel Corporation

Filed Sept. 12, 1969, Ser. No. 857,515
Int. Cl. B05c *11/00*
U.S. Cl. 118—60 **6 Claims**



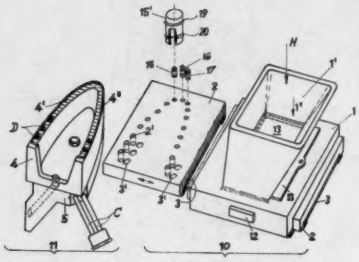
Molten zinc-coated material is wrap contacted with unequal-sized, internally cooled, chromium-plated rolls prior to solidification to inhibit the formation of undesirable spangling of the zinc-coated surface.

3,608,521

APPARATUS FOR APPLYING ADHESIVE

Georg Gopel, Frankfurt am Main, Germany, assignor to Maschinenfabrik Moenus AG, Frankfurt am Main, Germany

Filed July 24, 1969, Ser. No. 844,519
Claims priority, application Germany, July 27, 1968, P 17 60 978.8
Int. Cl. B05c *1/02*
U.S. Cl. 118—202 5 Claims



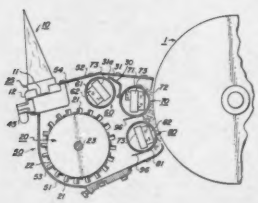
A support has a heated contact surface onto which the margin of a lasted insole is to be placed. A supply arrangement is located spaced from the support and supplies particulate dry powdered substance thermoplastic adhesive. A transfer device receives quantities of the adhesive powder from the supply arrangement and deposits them on the heated surface without coming in contact with the latter. The adhesive melts when heated by engagement with the contact surface and is then ready for application to the margin of an insole which is to be connected with a shoe upper.

3,608,522

XEROGRAPHIC DEVELOPMENT CONTROL APPARATUS

James R. Davidson, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed June 4, 1969, Ser. No. 830,238
Int. Cl. B05b *5/00*
U.S. Cl. 118—637 5 Claims



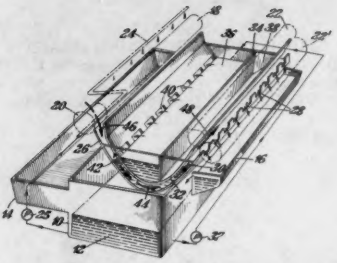
Apparatus for controlling the introduction of magnetizable developer material to a plurality of magnetic developing rollers for effecting the development of latent electrical charges selectively retained on a support surface in image configuration. The developing apparatus is continually operable with image development being effected by gating developer material to the magnetic developing rollers or recirculating the developer material in the developer apparatus removed from the effective magnetic field of the developing rollers.

3,608,523

WET ELECTROSTATIC TONING APPARATUS

Lester H. Jeffery, Apalachin, and Edward J. Radin, Johnson City, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,225
Int. Cl. G03g *13/60*
U.S. Cl. 118—637 9 Claims



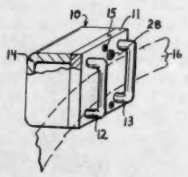
Liquid toning solution is sprayed on a wire wound roller to prewet a sheet or web of copy material as the latter is fed downwardly between such roller and a drive roller to squeegee such web or sheet. The web with the face up then enters the arcuate space between upper and lower trays containing liquid toner with the face up. The underside of the upper tray is metallized to provide image intensification by the reinforced lines of force between such metal surface and the electrostatic latent image areas of the copy as web passes through the toner solution in close proximity to the upper tray. The latter is provided with a vertical wall adjacent the rear thereof, and with front wall having a row of rectangular openings through which the toner liquid cascades into the lower tray by first impinging upon the faceup copy of the web, causing the latter to be forced down and away from the underside of the upper tray, inhibiting undesirable copy surface imperfections. The copy web is drawn upwardly from the arcuate space by squeegee rollers located above an elongated pan at the back of a toner reservoir for also receiving liquid overflow from the lower tray, through a horizontal row of recesses in the upper edge of rear wall of such tray. The liquid is returned to the reservoir from such pan, and then pumped back into the upper tray.

3,608,524

SOUND-ACTUATED ANIMAL-TRAINING DEVICE

Thomas M. Waltz, Stamford, Conn., assignor to Wands, Inc., Stamford, Conn.

Filed July 24, 1969, Ser. No. 844,263
Int. Cl. A01k *15/00*
U.S. Cl. 119—29 15 Claims



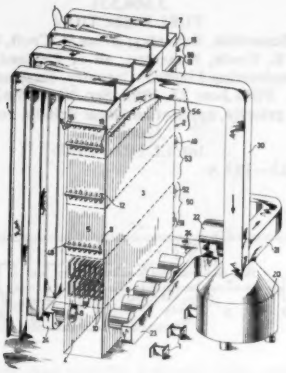
A light, compact training device arranged to be worn by a dog or the like and including a pair of electrodes which are adapted to be held in electrical contact with the animal being trained and which have a relatively low energy series of pulses applied thereto in response to a predetermined minimum noise made by the animal; there being a means provided for limiting the maximum amount of energy that may be applied across said electrodes during a given series of said pulses.

3,608,525

VAPOR GENERATOR AND STRUCTURAL UNIT THEREFOR

Harendra Nath Sharan, Seuzach/ZH, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Apr. 17, 1970, Ser. No. 29,423
Claims priority, application Switzerland, Apr. 17, 1969, 5805/69
Int. Cl. F22b *37/24*
U.S. Cl. 122—6 A 13 Claims



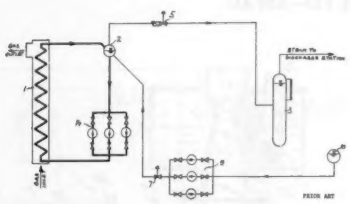
The structural units are prefabricated to define the heating surfaces of the vapor generator. Each unit is formed of pipe panels disposed in parallel in a horizontal plane as well as wall parts which define a part of the sidewalls of the vapor generator. Some units have pipe ends which extend through the wall parts in gastight relation in order to connect to a header or manifold.

3,608,526

METHOD AND APPARATUS FOR DERIVING USEFUL STEAM FROM A FLUCTUATING HEAT SOURCE

Roland Kemmetmueller, Pittsburgh, Pa., assignor to American Waagner-Biro Company, Inc., Pittsburgh, Pa.

Filed Aug. 5, 1969, Ser. No. 847,574
Int. Cl. F22b *1/18*
U.S. Cl. 122—7 R 12 Claims



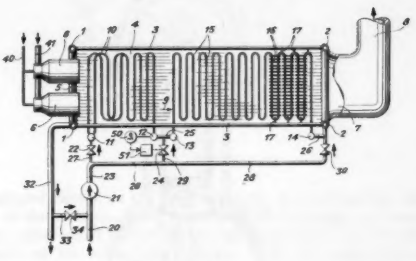
A method and apparatus for deriving useful steam from a fluctuating source of heat. The apparatus includes a heat-exchanger system which operates under conditions of high heat transfer with natural circulation when steam is withdrawn from the system and which requires forced circulation during operation under conditions of low heat transfer. A single high-pressure booster pump installation coacts with the system to provide a supply of new liquid to the system during periods of high heat transfer and to provide forced circulation during periods of low heat transfer, the booster pump installation being operated constantly at its full capacity and controlled to achieve a constant liquid flow through the system under all operating conditions. The booster pumps have their output connected to a jet pump which forms part of the system so that natural circulation can take place through the jet pump while forced circulation can be provided by way of a jet provided in the jet pump by the booster pumps.

3,608,527

HOT-WATER GENERATOR

Werner Stiefel, Wintherthur, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Nov. 12, 1969, Ser. No. 875,675
Claims priority, application Switzerland, Oct. 6, 1969, 14977/69
Int. Cl. F22b *21/22*
U.S. Cl. 122—235 R 7 Claims



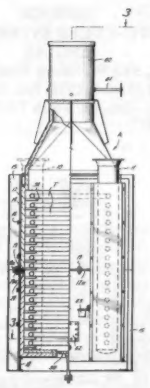
The hot-water generator has at least one whirling-muffle burner at the entry to the combustion gas flue so as to direct a combustion gas of high heat, e.g. 1,700° C., against contact-heated heating surfaces in the flue. The heating surfaces are subdivided so that the first heating surface encountered by the gas flow carries only a part of the total water flow. Succeeding heating surfaces carry increased proportions of the total water flow.

3,608,528

GAS AND VAPOR HEATERS

Hugo C. Mieth, P. O. Box 3152, Houston, Tex.

Filed Nov. 24, 1969, Ser. No. 879,047
Int. Cl. F22b *37/24*
U.S. Cl. 122—510 3 Claims



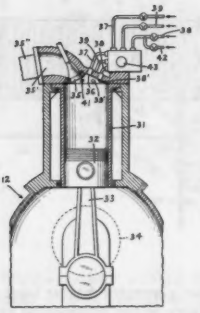
A gas and vapor heater which is prefabricated at the shop in sections with the casing, refractory, coils and heaters all complete and unitized, whereby a plurality of such sections may be readily assembled together in the field with a minimum of welding and assembly time, and wherein each section has its heater coils disposed substantially horizontally and each section is of such a height that it can be readily

transported by truck or rail to the field in the prefabricated condition.

3,608,529
AIR-POLLUTION-FREE AUTOMOBILE AND METHOD OF OPERATING SAME

Richard D. Smith, Palo Alto, and Dale A. Furlong, Sunnyvale, both of Calif., assignors to Combustion Power Company, Inc., Palo Alto, Calif.

Continuation-in-part of application Ser. No. 796,089, Feb. 3, 1969. This application May 1, 1969, Ser. No. 820,941
Int. Cl. F02d *19/00*; **F02b** *75/12, 33/00*
U.S. Cl. 123—25C **28 Claims**

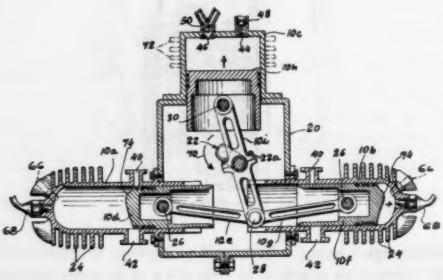


An air-pollution-free internal combustion engine and method for operating such engine in which the engine has at least one cylinder, an exhaust port and exhaust valve, fuel, oxygen gas and water spray injectors and a piston in the cylinder, throttle valves for the injectors, a fuel storage and supply system for feeding hydrogen gas or liquid gasoline to the fuel injector, an oxygen storage and supply system for feeding oxygen at first and second pressures to the oxygen gas injector and a water recovery system for recovering water from the exhaust discharged from the cylinder and for feeding the recovered water to the water spray injector.

3,608,530
LEVER-TYPE TWO-CYCLE INTERNAL COMBUSTION ENGINE

Edward C. Wenzel, 553 W. Shore Trail, Sparta, N.J.

Filed Mar. 3, 1970, Ser. No. 15,999
Int. Cl. F02b *75/24*
U.S. Cl. 123—56 BC **10 Claims**

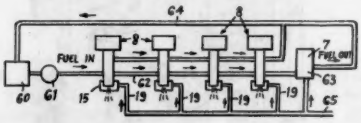


An internal combustion engine having opposed power cylinders and separate air or air-fuel charging cylinders, and a lever system interconnecting the power and air or air-fuel charging cylinder pistons with each other and with a crankshaft. The lever system comprises the piston rods of the power and air or air-fuel pistons, each piston rod being pivotally connected at one end to its respective piston and being pivotally connected at its opposite end to the corresponding opposite ends of the other two piston rods. One of said piston rods—namely, the piston rod of the air or air-fuel charging cylinder—is connected intermediate its ends to a crankshaft and said piston rod accordingly functions as the lever which drives the crank arm of the engine.

3,608,531
FUEL INJECTION

Albert E. Baxendale, Coventry; Brian H. Croft, Coventry, and George E. Fowle, Nuneaton, all of England, assignors to Brico Engineering Limited, Coventry, England

Filed June 23, 1969, Ser. No. 835,620
Claims priority, application Great Britain, July 4, 1968, 32060/68
Int. Cl. F02m *25/06*
U.S. Cl. 123—119 A **1 Claim**

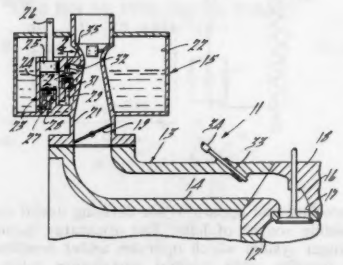


The present invention relates to a fuel injection system for internal combustion engines. The system comprises at least one electromagnetically operated fuel injector for the injection of fuel into the induction pipe or manifold of the engine and means to provide a supply of exhaust gas from the engine to assist in atomization of the fuel. The flow of the exhaust gas is caused by the pressure differential between the exhaust gas pressure and the depression in the induction pipe or manifold. The fuel pressure to the injectors is adjusted as a function of the pressure of the exhaust gas to provide compensation for variations in fuel flow arising from changes in the pressure of the exhaust gas supply.

3,608,532
WETTING OF INTAKE MANIFOLD

Robert N. Balluff, Rives Junction, Mich., assignor to Tenneco Inc., Houston, Tex.

Filed Apr. 29, 1969, Ser. No. 820,134
Int. Cl. F02m *19/00*
U.S. Cl. 123—139 AU **1 Claim**



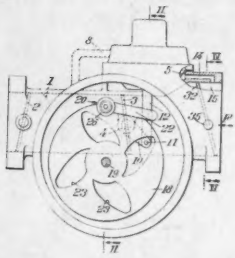
A wetting system for the intake manifold of an automotive internal combustion engine. The system includes an intake manifold and carburetor for delivering a charge to the intake manifold. A device is incorporated for shutting off the flow of fuel during extreme decelerations to reduce the emission of smog producing constituents from the exhaust and nozzles deliver fuel from the accelerating pump to the intake manifold for rewetting the manifold upon reacceleration for promoting smoother operation.

3,608,533

FUEL FEED DEVICES FOR INTERNAL COMBUSTION ENGINES

Andre L. Mennesson, Neuilly-sur-Seine, France, assignor to Societe Industrielle De Brevets Et D'Etudes S.I.B.E., Neuilly-sur-Seine, France

Filed Dec. 9, 1969, Ser. No. 883,560
Claims priority, application France, Dec. 10, 1968, 177,509
Int. Cl. F02m *39/00*; F02d *1/04*
U.S. Cl. 123—139 AW 6 Claims



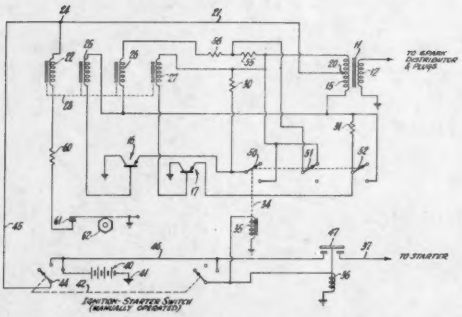
The induction pipe includes a throttle valve controlled by the driver and an auxiliary throttle member which opens automatically as a function of the airflow. An eccentric butterfly valve opens under the influence of the airflow and contrary to the variable resilient action of a member responsive to the engine temperature. A passage short circuits the throttle and is progressively closed by a piston proportionately with the opening of the eccentric butterfly valve as the engine heats up.

3,608,534

CONTINUING HIGH FREQUENCY ENERGY IGNITION SYSTEM WITH IMPROVEMENTS

Robert E. Canup, Richmond, Va., assignor to Texaco Inc., New York, N.Y.

Filed May 1, 1970, Ser. No. 33,786
Int. Cl. F02p *3/02*
U.S. Cl. 123—148 E 4 Claims



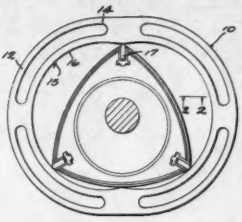
In connection with an ignition system that employs continuing high frequency energy for supplying a spark having a predetermined duration, there are relay controlled circuits for adding and removing resistances that will shift the circuit gain and compensate against a change in frequency.

3,608,535

SEALANT FOR WEAR-RESISTANT COATING

John H. Winston, Menomonee Falls, and Burzoe K. Ghandhi, Milwaukee, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 6, 1968, Ser. No. 773,764
Int. Cl. F02f *1/00*; F02b *55/14*
U.S. Cl. 123—193 C 2 Claims



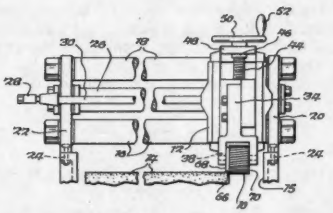
Disclosed herein is the impregnation of a sealant in the pores of the wear-resistant coating on the cylinders or combustion chamber of an internal combustion engine to prevent corrosion of the underlying cylinder walls and blistering of the wear-resistant coating and to thereby increase the life of the wear-resistant coating and the piston seals.

3,608,536

BURR AND METHOD OF PULPSTONE DRESSING

Charles B. Roberts, Jr., Lockport, N.Y., assignor to I. W. Roberts Manufacturing Co., Inc., Lockport, N.Y.

Continuation-in-part of application Ser. No. 751,312, Aug. 8, 1968, now abandoned. This application Apr. 2, 1969, Ser. No. 812,662
Int. Cl. B24b *53/14*
U.S. Cl. 125—11 CD 9 Claims



A method of dressing a pulpstone by employing a burr having teeth dimensioned to be completely inserted into the peripheral surface of the pulpstone to impart grooves of controlled depth therein and thereby define the land portions between the grooves to accurately control the grinding surface of the pulpstone. A smooth peripheral edge portion on the burr initially contacts the pulpstone to position the burr and bring it up to speed before traversing the pulpstone.

3,608,537

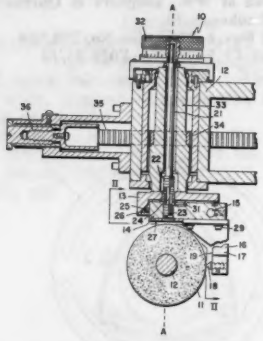
DRESSING MECHANISM

Herbert R. Uhtenwoldt, and Donald R. Johnson, both of Worcester, Mass., assignors to The Heald Machine Company, Worcester, Mass.

Filed June 25, 1969, Ser. No. 836,548
Int. Cl. B24b *53/06*
U.S. Cl. 125—11 A 3 Claims

A device for dressing an arcuate surface on a grinding wheel wherein a diamond tool is rotated about an axis on a

transversely pivoted platen to form the arc and adjusting screw means extends along the axis to transversely pivot the



tool in order to adjust the distance of the tool from the first axis.

3,608,538

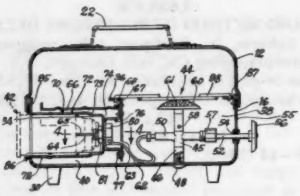
COMBINATION LUNCHBOX PROVIDED WITH MEANS FOR HEATING FOOD AND THE LIKE

Hermenegildo P. Guerrero, 7641 W. 61st Place, Argo, Ill.

Filed May 21, 1969, Ser. No. 826,544

Int. Cl. F24c *5/20*

U.S. Cl. 126—266 **5 Claims**



A lunchbox provided with means for receiving a displaceable container of liquid gas which supplies fuel to a burner element contained within the lunchbox to thereby heat the food and the like, and in which the lunchbox has a compartment for storing other objects, such as a vacuum bottle, food, and the like.

3,608,539

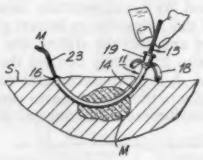
METHOD FOR THE BIOPSY OF SUBCUTANEOUS MASSES

Daniel G. Miller, 430 E. 86th St., New York, N.Y.

Filed Nov. 6, 1968, Ser. No. 773,787

Int. Cl. A61b *10/00, 17/34, 17/32*

U.S. Cl. 128—2 **6 Claims**



An instrument for the biopsy of subcutaneous masses includes an arcuate cannula having a serrated distal cutting end and is provided for alternative insertion, a correspondingly curved pointed stylet and a flexible ejector element. In performing a biopsy, and the skin is punctured and the cannula engaged stylet inserted through the puncture into the surface of the mass from its lateral or inferior aspect. The stylet is removed and the cannula advanced through the mass to cut and draw a specimen thereof into the cannula and the cannula is pushed through the overlying tissue to the skin, which is then punctured and the distal end of the cannula pushed through the puncture. The ejector is then pushed through the proximal end of the cannula to eject the specimen.

3,608,540

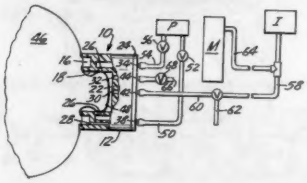
METHOD AND APPARATUS FOR AIDING IN THE DETECTION OF BREAST CANCER

Otto W. Sartorius, Santa Barbara, Calif., assignor to St. Croix Research Company, St. Paul, Minn.

Filed Feb. 24, 1969, Ser. No. 801,613

Int. Cl. A61b *10/00*

U.S. Cl. 128—2 R **10 Claims**



An apparatus is provided for infusing saline solution through the ductal system of the human breast, the apparatus comprising a cup having outer and inner sidewalls defining a peripheral and a central recess opening into the mouth of the cup with openings in the cup for drawing a vacuum in each of the recesses to sealingly attach the apparatus to the breast over the nipple and and enable infusion of solution into the breast ductal system. A method for detection of cancer of the breast is provided by drawing a vacuum around the breast nipple, then irrigating the breast ducts with saline solution infused through the nipple and thereafter examining epithelial cells in the saline solution following irrigation for abnormalities.

3,608,541

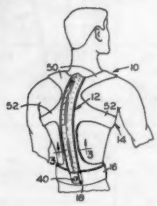
POOR POSTURE DETECTORS

Leland V. Hall, Riddle, Oreg., assignor to Oasis Electronics, Riddle, Oreg.

Filed Dec. 18, 1969, Ser. No. 886,188

Int. Cl. A61b *5/10*

U.S. Cl. 128—2 **10 Claims**



Flexible columns hinged at one side thereof have actuating cables at the opposite sides thereof which actuate warning indicators when the columns are flexed to extents in which the wearers have poor postures.

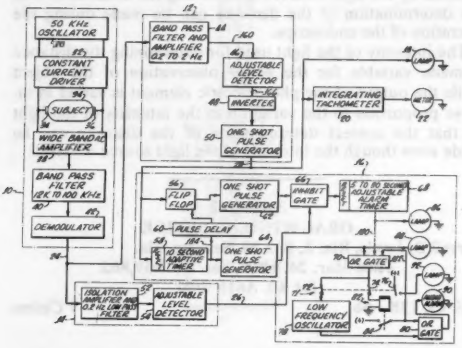
3,608,542
PHYSIOLOGICAL MONITORING SYSTEM

Allan F. Pacela, Diamond Bar, and Fredrick J. Savaglio, Yorba Linda, both of Calif., assignors to Beckman Instruments, Inc.

Continuation of application Ser. No. 656,805, July 28, 1967, now abandoned. This application June 12, 1970, Ser. No. 48,853

Int. Cl. A61b *5/04*

U.S. Cl. 128—2.1 R **43 Claims**



A respiration monitoring system utilizing an impedance pneumograph which provides an electrical signal having a characteristic that varies in accordance with transthoracic impedance changes during respiratory cycles. Motion artifacts and heart-coupled pulmonary blood flow signal components are eliminated by a narrow band-pass filter and amplifier in conjunction with an adjustable level detector which generates both respiratory rate and volume information in digital form to drive an integrating tachometer and an audiovisual alarm system having an adjustable alarm timer and an adaptive timer adapted to override the adjustable timer under certain conditions of respiration activity. Also, drifts in the total transthoracic impedance are monitored through the same alarm system to determine an equipment failure or loose electrode in the impedance pneumograph. The adjustable level detector discriminates against signals which do not exceed a first level related to respiratory inspiration after having dropped below a second level related to respiratory exhalation.

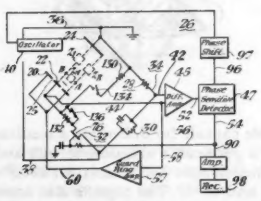
3,608,543
PHYSIOLOGICAL IMPEDANCE-MEASURING APPARATUS

Richard L. Longini, and Wils L. Cooley, both of Pittsburgh, Pa., assignors to Carnegie-Mellon University, Pittsburgh, Pa.

Filed Oct. 3, 1968, Ser. No. 764,748

Int. Cl. A61b *5/05*

U.S. Cl. 128—2.1 R **15 Claims**



In a physiological impedance-measuring apparatus, the combination comprising a pair of electrodes for spaced application to predetermined locations of the anatomy, an additional electrode spacedly juxtaposed to one of said first-mentioned electrodes, circuit means for applying a measuring voltage across said first-mentioned electrodes and a portion of said anatomy therebetween and for applying a potential to said additional electrode similar to that on the associated one of said first-mentioned electrodes, and an impedance-measuring circuit coupled to said electrodes for measuring anatomical impedance only between a predetermined pair of said electrodes. In certain applications wherein said circuit means include a unity-gain amplifier for applying a substantially identical potential at lower impedance to said additional electrode for driving the same.

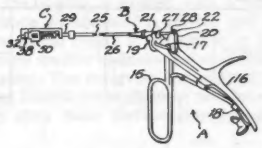
3,608,544
TRANSECTION AND SPECIMEN-TAKING INSTRUMENT

John W. Schnepper, 760 S. Washburn, Corona, Calif.

Filed Jan. 5, 1970, Ser. No. 547

Int. Cl. A61b *17/28;* **A61c** *03/14*

U.S. Cl. 128—2 R **7 Claims**



An instrument for surgical transection, specimen-taking and end-sealing of vessels, nerves and the like (as in vagotomy) having; (1) a clip-setting head to clamp spaced areas of a nerve or vessel and to apply and set hemostatic clips for sealing off those areas, having; (2) a shear for transecting the length of nerve or vessel between the sealed areas, and having; (3) a pocket to receive and hold the transected part for subsequent use as a biopsy specimen.

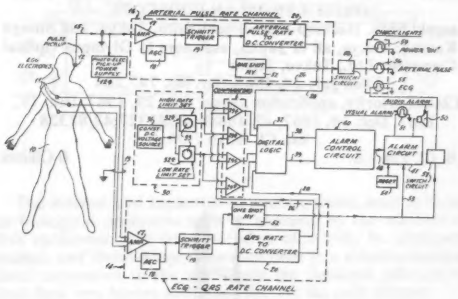
3,608,545
HEART RATE MONITOR

Bernard Novack, Fort Lee, and Jesse L. Acker, Rockaway, both of N.J., assignors to Medical Engineering Research Corporation, Parsippany, N.J.

Filed Nov. 25, 1968, Ser. No. 778,382

Int. Cl. A61b *5/02*

U.S. Cl. 128—2.06 **17 Claims**



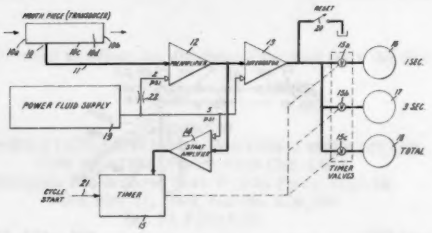
In a heart rate monitor, two electrical inputs derived from ECG. electrodes and from an arterial pulse pickup are received by separate channels to produce respective electrical outputs, such as, variable DC voltages, corresponding to the intervals between successive QRS and arterial pulses, and hence to the rates of such pulses, deviations of such electrical outputs beyond adjustably preset limits of allowable ranges therefor are detected, and an alarm is actuated, as through a digital logic circuit and preferably to operate in synchronism with the QRS pulses, only in response to patient conditions

represented by predetermined combinations of detected deviations of the electrical outputs outside the allowable ranges therefor. Further, suitable time delays are provided to cause actuation of the alarm soon after the occurrence of certain combinations of deviations, such as, no pulse and no ECG. or fibrillation (high ECG. rate and no pulse) and to delay the actuation of the alarm in the case of other deviations, such as, the combination of high ECG. or QRS and high arterial pulse rates.

3,608,546
FLUIDIC SPIROMETER

Jeffrey N. Shinn, Scotia, N.Y., assignor to General Electric Company

Filed Jan. 21, 1970, Ser. No. 4,706
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **19 Claims**

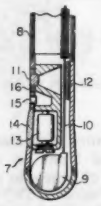


An expendable mouthpiece transducer, fluidic circuitry for preventing the breathed air from contaminating the nonexpendable portion of the spirometer, a fluidic integrator, timer and a three-gage readout form the basic elements of an improved spirometer. The transducer generates a pneumatic pressure signal proportional to airflow rate breathed therethrough and the integrator integrates the flow rate to obtain the volume of air breathed through the transducer over a period of time. The three gages are controlled by the timer for operation to determine the total volume breathed for 1 second, 3 seconds, and a total lung volume for 10 seconds. A fluidic preamplifier is connected between the transducer and integrator, and an additional fluidic amplifier provides a sufficient pressure output to actuate the timer.

3,608,547
METHOD FOR DETERMINING THE DISTANCE OF AN OBJECT FROM AN EDOSCOPE

Masaaki Sato, Hachioji-shi; Shoichi Saito, Tokyo, and Shinya Kosaka, Tokyo, all of Japan, assignors to Olympus Optical Company, Ltd., Tokyo, Japan

Filed July 24, 1968, Ser. No. 747,224
Claims priority, application Japan, July 29, 1967, Dec. 19, 1967, Dec. 19, 1967, 42/48686;42/81327;42/81328
Int. Cl. A61b *1/06*
U.S. Cl. 128—6 **6 Claims**



Method for determining the distance of an object from an endoscope which comprises the steps of emitting a light of predetermined intensity and receiving the light reflected from the object having substantially the same reflecting power over the entire area thereof by a photoelectric element, the intensity of the reflected light being the function of the distance from the object, the photoelectric element produces an electrical signal corresponding to the distance. The signal thus produced is recorded and compared with a previously prepared chart indicating the relation between the signal and the distance so that the distance is determined after the operation of the endoscope is completed.

The spectroscopic characteristics of the light used for determining the distance is so selected that the film contained in the endoscope for photographing the object is not affected by the light used for determining the distance so that the determination of the distance can be made during the operation of the endoscope.

The intensity of the light used for determining the distance is made variable for the better observation of the object while the output of the photoelectric element is varied in inverse proportion to the variation in the intensity of the light so that the correct determination of the distance can be made even though the intensity of the light source is varied.

3,608,548
ORAL HYGIENE DEVICE

Terrell D. Lewis, Rte. 2, Box 38, Sebring, Fla.

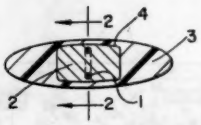
Filed Mar. 24, 1969, Ser. No. 809,862
Int. Cl. A61h *9/00*
U.S. Cl. 128—66 **7 Claims**

An oral hygiene device comprising a brush having a tubular handle with rows of bristles extending laterally from one end and a discharge nozzle positioned between the outside rows of bristles substantially contacting the adjacent bristle tufts to brace such tufts and provide a clear discharge space for liquid issuing from the nozzle so the liquid will directly contact the teeth and gums and means are provided to produce a pulsating action on the liquid to increase the stimulation of circulation and to flush the loosened particles and also dilute the mouth acids. The handle is made in two parts with the bristle-carrying portion removable for replacement.

3,608,549
METHOD OF ADMINISTERING DRUGS AND CAPSULE THEREFOR

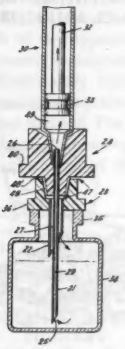
Edward W. Merrill, Cambridge, Mass.

Filed Jan. 15, 1970, Ser. No. 3,073
Int. Cl. A61m *31/00*
U.S. Cl. 128—260 **8 Claims**



An implantable capsule for delivering a medicament to live animals having a permeable elastomeric wall and containing a mixture of medicament and matrix material which melts between 40° C. and 47° C. The capsule also contains a metal coil capable of being inductively heated by a coil external to the body. When delivery of medicament is desired, the coil is inductively heated to melt the mixture and effect diffusion of medicament through the permeable wall.

3,608,550
TRANSFER NEEDLE ASSEMBLY
Theodore H. Stawski, Union, N.J., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed May 7, 1969, Ser. No. 822,455
Int. Cl. A61j 1/00
U.S. Cl. 128—272 7 Claims

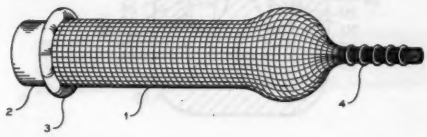


A transfer needle assembly for transferring fluid from a fluid source to a fluid collection container. The assembly includes support means adapted at its rear end to be associated with the collection container and at its forward end to the fluid source. A first cannula is mounted on the support means and is adapted to be connected at its forward end to the fluid source and at its rear end to the collection container. A second cannula is mounted on the support means and is adapted to be connected at its forward end to the fluid source and at its rear end to the atmosphere. In this manner, fluid is permitted to be transferred from a fluid source to a collection container by atmospheric pressure when the volume within the collection container is sufficiently increased.

3,608,551
MENSTRUAL RECEIVER
Saburo Seijo, 95, Okarucho, Kashiwara Nara Prefecture, Japan
Filed Oct. 11, 1968, Ser. No. 766,769
Int. Cl. A61f 13/16
U.S. Cl. 128—288 3 Claims

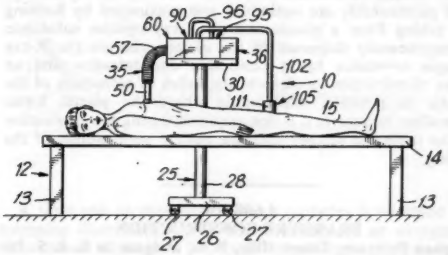
Menstrual short panties provided with an elastic piece fixed either directly or by the intermediary of a network to the middle piece of panties at both sides in an elongated condition, with which a napkin is kept raised by the elasticity of elastic piece to be sufficiently close to the private parts of human female body irrespective of her physical movements in daily life to prevent leakage of blood.

3,608,552
MALE URINAL DEVICE
Arthur B. Broerman, 5901 Baylor, Bartlesville, Okla.
Filed Feb. 5, 1970, Ser. No. 8,819
Int. Cl. A61f 5/44
U.S. Cl. 128—295 7 Claims



A male urinal device comprised of a fabric base tubular expansible liquid conveying sheath adapted to receive the penis and to be affixed thereto in fluidtight relation. The fabric basic tube of the sheath is coated with a suitable liquid repelling substance which itself is pliable and elastic. The downstream end of the sheath is adapted to be connected to a tube of relatively smaller diameter for conveying urine to a receiving container. The receiving container is preferably a container having flexible walls which in turn have projections extending from their inner surfaces toward opposite walls thereof.

3,608,553
ULTRASONIC METHOD AND APPARATUS FOR TISSUE GRAFTING
Lewis Balamuth, New York, N.Y., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.
Continuation-in-part of application Ser. No. 655,118, July 21, 1967, now Patent No. 3,526,219. This application Sept. 4, 1969, Ser. No. 855,126
Int. Cl. A61b 17/00, 17/32
U.S. Cl. 128—303 31 Claims

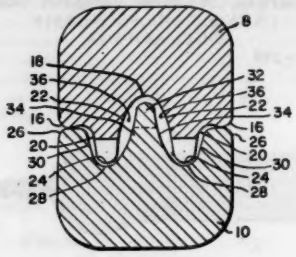


The method and apparatus of grafting tissue, such as tissue in biological organisms such as humans, by the removal of live epidermal cells from one area of a body by ultrasonic means, and then transporting such cells in a suitable isotonic fluid suspension to the site where the fluidized cells are to find their new homes and then applying the cells thereto.

3,608,554
SURGICAL CLAMPING MEANS
Michael G. McGuinness, Cornwells Heights, and William H. Pilling, Ardmore, both of Pa., assignors to Pilling Co., Fort Washington, Pa.
Filed Dec. 22, 1969, Ser. No. 887,131
Int. Cl. A61b 17/28, 17/08
U.S. Cl. 128—321 4 Claims

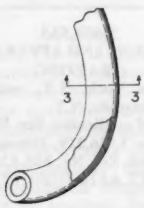
A surgical clamping means is provided with serrated jaws presenting to body tissues surfaces which are relatively

rounded rather than sharp to avoid damage to the tissues while nevertheless effecting secure clamping action by



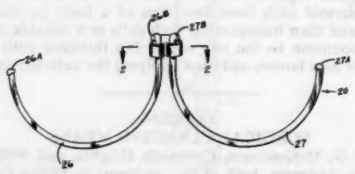
presenting pocketlike regions within which expanded portions of the tissues are clamped.

3,608,555
RADIO OPAQUE AND OPTICALLY TRANSPARENT TUBING
William L. Greyson, Wayne, N.J., assignor to Chemplast Inc., Wayne, N.J.
Filed Dec. 31, 1968, Ser. No. 792,896
Int. Cl. A61m *25/00*
U.S. Cl. 128—348 **4 Claims**



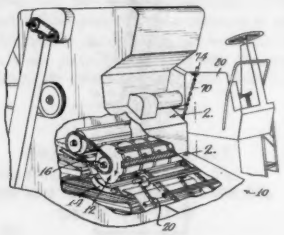
Tubing having a smooth inner bore and a smooth even outer surface wherein the properties of X-ray opacity and optical permeability are optimized and maximized by forming the tubing from a plastic and an X-ray opaque substance homogeneously dispersed in the plastic wherein the X-ray opaque substance has a controlled concentration and an index of refraction as close to the index of refraction of the plastic as possible; additionally where the plastic forms crystalline structures it is not annealed during the fabrication of the tubing to further optimize optical permeability of the tubing.

3,608,556
BRASSIERE CONSTRUCTION
Stephen Paterson, Forest Hills, N.Y., assignor to S. & S. Industries, Inc., Bronx, N.Y.
Filed Feb. 20, 1969, Ser. No. 800,862
Int. Cl. A41c *1/14*
U.S. Cl. 128—472 **10 Claims**



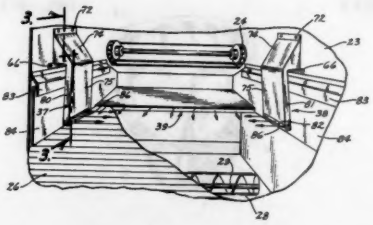
A brassiere construction comprising a pair of U-shaped members to which fabric breast cups are secured, having a substantially rectangular cross-sectional shape in which the longer-dimension extends radially of the curvature thereof and in which the respective U-shaped members are hingedly connected so that they may be disposed between a foldable overlying position and an operative wearing position. An improved hinge construction is also provided to limit the relative rotation of the respective U-shaped members in the operative wearing position.

3,608,557
HARVESTING MACHINE DESLUGGING MECHANISM
Thomas Evans, Bettendorf, Iowa, assignor to J. I. Case Company
Filed Mar. 4, 1970, Ser. No. 16,416
Int. Cl. A01f *12/28*
U.S. Cl. 130—27 AC **10 Claims**



A remotely controlled deslugging mechanism for removing trapped material from between a threshing cylinder and an adjacent concave of a harvesting machine. The deslugging mechanism includes a fluid ram having a cylinder pivoted about an axis laterally offset to one side and above the pivot axis of the threshing cylinder with a piston rod extending above the axis for the threshing cylinder. The threshing cylinder shaft has a ratchet wheel rotatable therewith and the piston rod has a cooperating pawl so that extension and retraction of the piston rod will cause the threshing cylinder to be rotated in a direction opposite to the normal direction of rotation to remove any "slug" of material from between the cylinder and the concave. The pawl is normally maintained in engagement with the ratchet wheel by gravity and the mechanism incorporates means for normally maintaining a pawl spaced from the ratchet wheel to accommodate normal rotation of said threshing cylinder.

3,608,558
AIR MANIFOLD FOR A COMBINE CHAFFER MATERIAL LEVELER AND AERATOR
Vernon H. Sietmann, Laurel, Iowa, and Gerald F. Dendel, 236 E. 16th St., Costa Mesa, Calif.
Filed Feb. 24, 1969, Ser. No. 801,514
Int. Cl. A01f *12/48*
U.S. Cl. 130—27 AE **9 Claims**



This invention relates to an attachment for a conventional grain combine which includes a sieve or chaffer area where the grain is delivered for finish cleaning, and comprises a high-speed blower that automatically delivers a flow of air under static pressure through a pendulum-operated valve for controlled transmission of air through a plurality of conduits arranged in parallel to manifolds on opposite sides of the

chaffer and to a manifold extended tranversely across the combine. All of the manifolds are mounted adjacent the front of the chaffer to deliver a majority of air to the downhill side of the chaffer for directing grain to the uphill side while always maintaining a small amount of air to the uphill side to prevent clogging of the uphill manifold, and to deliver air through the transverse manifold to direct air to the substantially horizontal flow of grain to thereby separate chaff and trash from the heavier grain, effecting an aeration of the material which aids in cleaning. The manifolds on the opposite side of the chaffer are stationary and are not movable with the chaffer. Each of the oppositely disposed manifolds includes a manifold housing connected to its respective conduit and extending downwardly therefrom. A horizontally disposed discharge opening is provided in the manifold housing above the lower end thereof. The cross-sectional area of the lower end of the manifold housing is less than the cross-sectional area at the upper end of the housing to maintain peak output pressure.

3,608,559

PROCESS OF INTRODUCING ASHING INGREDIENTS INTO OXIDIZED CELLULOSE MATERIAL INTENDED AS SMOKING PRODUCT AND PRODUCT OBTAINED THEREBY

Theodore S. Briskin, and Geoffrey R. Ward, both of Beverly Hills, Calif., assignors to Sutton Research Corporation, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 595,622, Nov. 21, 1966, now abandoned , and a continuation-in-part of 674,994, Oct. 12, 1967, now abandoned. This application July 17, 1968, Ser. No. 745,370

Int. Cl. A24b *15/00*

U.S. Cl. 131—2 **23 Claims**

A method of making a smoking product formed of oxidized cellulosic material is disclosed in which incorporation of ash forming components is effected in the form of mineralizing agents preferably developed in situ internally of the oxidized cellulosic fibers by treatment first with a calcium compound in aqueous medium and then with oxalic acid to form insoluble calcium oxalate in situ or by treatment of the cellulosic materials with the freshly mixed components which remain soluble in admixture for a length of time sufficient for internal absorption into the oxidized cellulosic system.

3,608,560

SMOKABLE PRODUCT OF OXIDIZED CELLULOSIC MATERIAL

Theodore S. Briskin, and Geoffrey R. Ward, both of Beverly Hills, Calif., assignors to Sutton Research Corporation, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 595,622, Nov. 21, 1966, Pat. No. 3,447,539, Continuation-in-part of application Ser. No. 674,994, Oct. 12, 1967, now abandoned. This application Nov. 7, 1968, Ser. No. 774,187

Int. Cl. A24b *15/00;* **A24d** *01/18*

U.S. Cl. 131—2 **5 Claims**

A smokable product of oxidized cellulosic material formulated to include combustible carbon in an amount within the range of 2–50 percent by weight of the oxidized cellulosic material for the improvement in the smoking characteristics of the smoking product forward thereof. The combustible carbon particles are of approximate colloidal dimensions and increase the heat of combustion of the oxycellulose. Melting of the oxycellulose is minimized with the carbon additive. Further, the carbon particles may carry a volatile additive absorbent thereon and function as a filtration means downstream from the combustion area. The carbon particles may be secured to the oxycellulose by means of a soluble carbohydrate binder.

3,608,561

EXTENDER MEANS FOR ATTACHMENT OF AN AUXILIARY CIGARETTE FILTER

Mortimer Russel Dock, New York, N.Y., assignor to The H-2-O Filter Corporation, New York, N.Y.

Filed Jan. 15, 1970, Ser. No. 3,090

Int. Cl. A24d *01/04;* **A24f** *13/06, 13/08*

U.S. Cl. 131—10 A **4 Claims**

This invention relates to extender means for optional attachment of an auxiliary cigarette filter to a conventional cigarette. The extender means comprises a tubular body having ridges on its internal surface. Each said ridge defines dual vertices creating an air duct therebetween to rarify the smoke drawn through the cigarette.

3,608,562

METHOD AND APPARATUS FOR PRODUCING A TOBACCO ROD

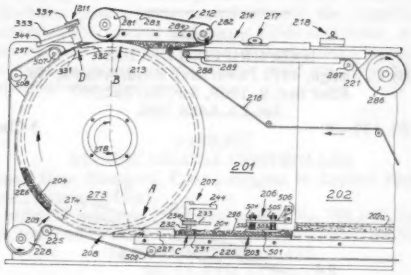
Jurgen Gomann, Hamburg, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg-Bergedorf, Germany

Filed Jan. 24, 1969, Ser. No. 793,647

Claims priority, application Germany, Feb. 7, 1968, P 16 57 249.9

Int. Cl. A24c *05/18*

U.S. Cl. 131—24 D **16 Claims**



A filler rod of shredded tobacco particles is obtained by trimming diametrically two opposite sides of an elongated filler stream adjacent to two longitudinally spaced portions of plural paths along which the stream is moved by a system of conveyors. At least one of the trimming devices is adjustable in dependency on measurements performed by a testing device which determines the amount of tobacco shreds in successive increments of the rod. The stream is compacted pneumatically or mechanically upstream of and/or adjacent to the trimming devices.

3,608,563

CIGARETTE FILTER

John B. Schmitz, 1856 Oakwood, Arcadia, Calif.

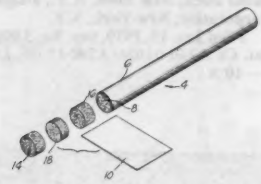
Filed Feb. 6, 1969, Ser. No. 797,135

Int. Cl. A24b *15/02;* **A24d** *1/06*

U.S. Cl. 131—265 **2 Claims**

A cigarette filter including crushed and screened substantially uniformly sized particles of flux calcined diatomaceous earth, the smaller particles being approximately no less than 25 percent of the size of the larger particles to prevent undesirable smoke flow restriction from filling of voids, wherein an exemplary broad size range is from approximately 100 to

425 microns and an exemplary optimum size range, when the particles are associated with conventional cellulose filters, in



order to prevent undue draft restriction, is from 175 to 210 microns.

3,608,564
CIGARETTE FILTER

Hiroji Takahashi, Hiroshima; Atsushi Saito, Toyama; Kazuo Kuwahara, Yamaguchi; Katsumi Hayashi, Tokyo; Takashi Kaneko, Hiroshima; Shigeya Hayashi, Tokyo, and Kenji Okano, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Co., Ltd. and Mitsubishi Acetate Co., Ltd., Chuo-ku, Tokyo, Japan

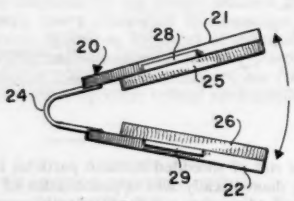
Filed May 15, 1969, Ser. No. 825,069
Claims priority, application Japan, May 15, 1968, 43/32728
Int. Cl. A24b *15/02;* **A24d** *01/06*
U.S. Cl. 131—266 **22 Claims**

Cigarette filters comprising one graft polymer selected from the group consisting of polyvinyl alcohol grafted with at least one monoethylenically unsaturated vinyl monomer and partially saponified polyvinyl alcohol grafted with at least one monoethylenically unsaturated vinyl monomer. A plug comprising a bundle of opened fibers to fit a cigarette carries said polymer.

3,608,565
HAIR GRIPPING DEVICE

Beverly C. Ensign, 4971 Powerferry Road, Atlanta, Ga.

Filed Dec. 9, 1968, Ser. No. 782,397
Int. Cl. A45d *2/06*
U.S. Cl. 132—9 **3 Claims**



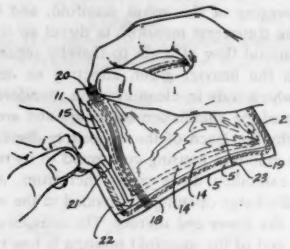
A hair gripping device for holding the hair of the head while backcombing the hair. A form fitting hand covering is provided which includes a body portion sized and shaped to cover primarily only the hand knuckles of the thumb and forefingers, and a thumb sheath and a forefinger sheath are connected to the body portion. The remaining portion of the hand is left uncovered, and the thumb and forefinger are used to grasp and grip the hair of the head during the backcombing procedure while the remaining hand area is uncovered and unencumbered so that it retains its sense of feel.

3,608,566
APPLICATOR PACKAGE

Duane L. Storandt, 8744 Rankin, Brentwood, Mo.

Filed Apr. 7, 1969, Ser. No. 813,871
Int. Cl. A45d *44/18*
U.S. Cl. 132—84 **12 Claims**

An applicator package having an inner pouch of moisture absorptive material enclosed within an outer pouch or envelope and attached thereto along a relatively narrow line located adjacent the inner pouch opening, there being a tear

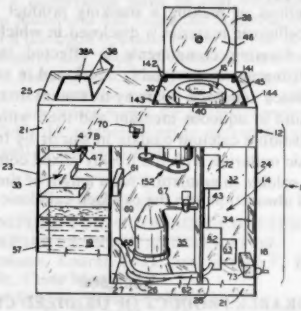


string disposed around the perimeter of said envelope for facilitating opening same on all sides.

3,608,567
FILTER CLEANING PROCESS AND APPARATUSES

Scott E. Neill, Jr., 1147 H St., Salida, Colo.

Continuation-in-part of application Ser. No. 727,594, May 8, 1968, now Patent No. 3,526,237. This application June 26, 1970, Ser. No. 50,169
Int. Cl. B08b *3/02; 11/00*
U.S. Cl. 134—58 **3 Claims**



A process organized to successively apply a jet of cleansing liquid to the exterior surface of each successive portion of a complex-shaped thin-walled dirty-air-permeable air filter while the interior surface of that thin-walled portion is concurrently supported from collapse by the mechanical action of said jet.

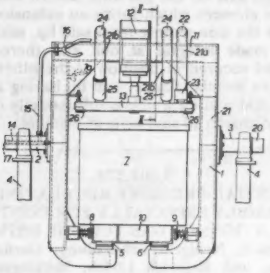
3,608,568
MACHINES FOR PROCESSING ARTICLES

Victor Hallsworth, Ashton-U-Lyne, England, assignor to Sturtevant Engineering Co., Ltd.

Filed Feb. 9, 1970, Ser. No. 9,720
Claims priority, application Great Britain, Jan. 28, 1970, 4083/70
Int. Cl. B08b *3/04*
U.S. Cl. 134—120 **4 Claims**

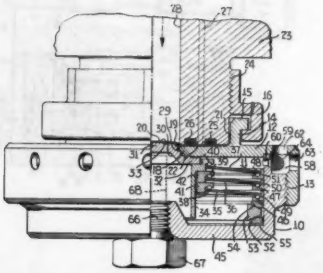
An article-processing machine which comprises a housing in which is a support for an open-topped container for articles to be processed, a member to engage the open top of the container and means to angularly displace the member container and support in the engaged condition, a feed line to

the member to feed processing liquid to the container while it is in motion and a valve carried by the member to control a



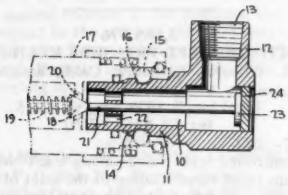
passage through which liquid may be discharged from the container.

3,608,569
PRESSURE RELIEF VALVE WITH FRANGIBLE DISK
John R. Burns, Culver City, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Sept. 15, 1967, Ser. No. 668,038
Int. Cl. F16k *17/16*; B64d *45/00*
U.S. Cl. 137—69 **14 Claims**



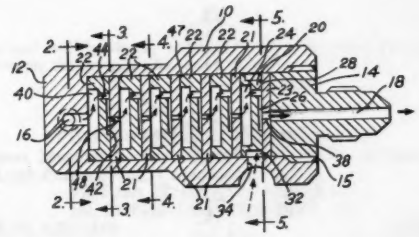
A relief valve in which a passage through the valve is closed by both a frangible diaphragm and a valve poppet, the diaphragm being supported against bursting by the poppet when the latter is in its closed position but not when in its open position, the poppet being pressed with decreasing force towards its closed position throughout the range of its opening movement by a negative rate spring.

3,608,570
VALVE UNIT
Serge N. McKhann, 425 E. 63rd St., New York, N.Y., and William T. Bahr, 1465 Tuttle Ave., Wallingford, Conn.
Filed Feb. 27, 1969, Ser. No. 802,990
Int. Cl. F16k *17/38*
U.S. Cl. 137—75 **5 Claims**



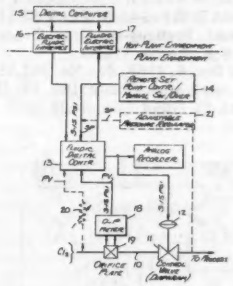
A valve unit is provided having an external fusible safety cutoff means. The unit is generally utilized as part of quick-disconnect couplings used in connecting lines containing combustible fluids, such as gas. The valve unit functions as a plug part and is provided with a rod member adapted at one end to engage a self-closing valve contained in a communicating socket part, which self-closing valve may be disposed to close the flow of fluid through said socket part, and having a flange at the other end in contact with, and constrained by, a fusible material. The fusible material constitutes an outside wall of said unit or is in the form of a ring which bonds the flange to the housing. When the temperature of the surrounding area reaches a predetermined degree, the material fuses, losing its constraining influence on the rod member which is then pushed outward allowing the self-closing valve to shut off the flow of fluid through the line.

3,608,571
FLUIDIC FLOW CONTROL VALVE
Richard L. Wilcox, Adel, Iowa, assignor to Delavan Manufacturing Company
Filed May 7, 1969, Ser. No. 822,426
Int. Cl. F15c *1/16*
U.S. Cl. 137—81.5 **10 Claims**



A fluidic flow control valve having a control fluid passage which communicates tangentially with a vortex chamber to form a control fluid vortex in the chamber, a power fluid inlet passage communicating radially with the chamber, and a discharge passage communicating with the chamber for discharging the control and power fluids therefrom. A plurality of resistor plates having vortex chambers therein are positioned upstream of the chamber and form fixed resistors in the control fluid stream.

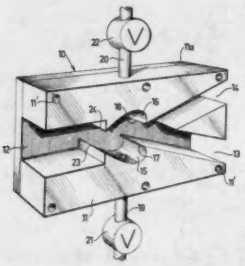
3,608,572
FLUIDIC DIGITAL CONTROLLER
Hyman Hass, Stamford, Conn., assignor to Applied Fluidics, Inc., Stamford, Conn.
Continuation-in-part of application Ser. No. 756,058, Aug. 28, 1968, now Patent No. 3,528,444. This application Sept. 12, 1969, Ser. No. 857,498
Int. Cl. F15c *1/12*
U.S. Cl. 137—81.5 **11 Claims**



A fluidic process controller for comparing a fluidic input analog pressure signal representing a set point (SP) with a fluidic input analog pressure signal representing a process variable (*PV*) to produce a fluidic output signal whose pressure is proportional to the error therebetween in order to govern a final control element in a direction and to an extent causing the process variable to return to the set point value.

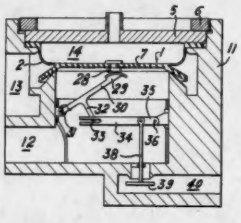
The controller includes a comparator having a trigger circuit responsive to the input signals to produce a fluidic output signal depending only on whether *PV* is lower or higher than SP and at a constant pressure level. This output signal is integrated to produce a control signal which is applied to the final control element. The final control element functions to vary *PV* in a direction reducing its difference with SP but causing *PV* to slightly overshoot SP before reversing direction, whereby the output signal is constituted by square wave pulses whose integrated pressure provides the control signal acting to regulate the final control element to maintain *PV* at the desired level.

3,608,573
FLUIDISTOR
Per Svante Bahrton, 182 75 Stocksund, 11 Villavagen, Sweden
Filed Feb. 4, 1969, Ser. No. 796,484
Claims priority, application Sweden, Feb. 6, 1968, 1537
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 **6 Claims**



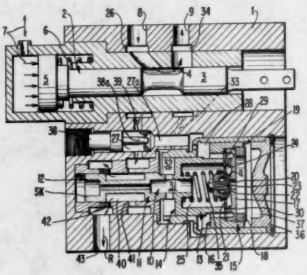
A fluidistor of the type comprising an inlet, at least two outlets, and an intermediate passage including at least one control chamber. The transition region between the inlet and the control chamber is designed to provide unstable flow to the control chamber. This increases the amplification of the device by reducing the control energy required to switch the output from one outlet to another. The unstable flow to the control chamber is caused by wedgelike shoulder means projecting substantially perpendicular to the direction of flow at the transition region from inlet to control chamber. The wedgelike shoulder means has a small dimension in the direction of flow as compared to the dimension perpendicular to the direction of flow. The transition region from the control chamber to the outlet is also sharply defined for the same reasons.

3,608,574
DIAPHRAGM-VALVE ESPECIALLY FOR A RESPIRATORY-GAS SUPPLY SYSTEM
Raymond Beaussant, Bretigny-sur-Orge, France, assignor to Intertechnique S.A., Plaisir, France
Filed Dec. 9, 1968, Ser. No. 782,151
Claims priority, application France, Dec. 19, 1967, 132 966
Int. Cl. G05d *7/00*; A62b *7/00*
U.S. Cl. 137—102 **3 Claims**



A diaphragm-valve, especially for a respiratory-gas supply system, comprising a flat diaphragm of revolution about an axis, a sealing lip adapted to cooperate with a seating and added to said diaphragm in the vicinity of its periphery, said lip having a substantially conical profile whose vertex is located on said axis on the gas inlet side of said diaphragm, and a bellows element which forms an extension of said flat diaphragm on the side remote from said lip, said bellows element being made integral at one end thereof with said diaphragm and secured in position at the other end thereof by means of an annular flange, said lip having a diameter of contact with said seating which is substantially identical with the effective diameter of said bellows element.

3,608,575
DIFFERENTIAL-PRESSURE REGULATING VALVE ASSEMBLY ESPECIALLY FOR CONTROL INSTALLATIONS OF GAS TURBINE DRIVE UNITS
Wilhelm Jurisch, Nelligen-Parksiedlung; Gerhard Walliser, Waiblingen, and Heinrich Ulrich, Metzingen, Wurthemberg, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed Mar. 20, 1969, Ser. No. 808,892
Claims priority, application Germany, Mar. 20, 1968, P 17 73 006.2
Int. Cl. G05d *11/00*
U.S. Cl. 137—117 **30 Claims**

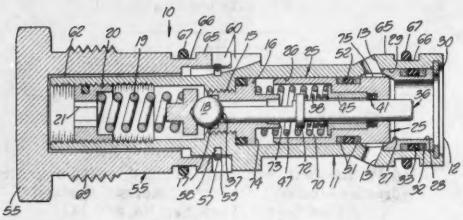


A differential pressure control valve assembly, especially for control installations of gas turbine drive units, in which the control slide valve controlling the backflow quantity of liquid is constructed as servo device only controlled by the control diaphragm which limits one or several servo pressure chambers for receiving a working medium removed from the hydraulic circulation system and having a variable servo-adjusting pressure between the higher hydraulic pressure upstream of the metering place and the lower hydraulic pressure downstream of the metering place; the servo-adjusting pressure is modulated in case of occurring control deviations by a control valve actuated by the control diaphragm in the sense that in case of exceeding the intended value of differential pressure, a larger return quantity is adjusted to by the piston slide valve and in case of dropping below the intended value of differential pressure, a smaller return quantity is adjusted to.

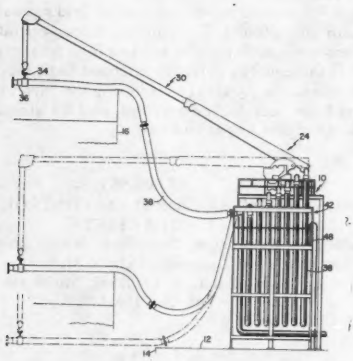
3,608,576
PILOT-CONTROLLED PRESSURE RELIEF VALVE
Raymond L. Wilhelm, Glendora, Calif., assignor to Circle Seal Corporation, Anaheim, Calif.
Filed Jan. 7, 1970, Ser. No. 1,215
Int. Cl. F16k *17/10*
U.S. Cl. 137—242 **13 Claims**

A pilot-controlled relief valve having a self-cleaning orifice past the main relief valve leading to the inlet of a pilot valve via a pressure equalizing chamber for the relief valve. A plunger movably supported in the orifice is reciprocated in one direction by the pressure drop produced upon opening of the pilot valve and in the opposite direction by the pilot valve spring, the latter being calibrated and determining the open-

ing and closing of the relief valve proper. A resilient wiper operates during reciprocation of the plunger to clean the sidewall of the control orifice and the relief valve has self-aligning engagement with a floating valve seat.



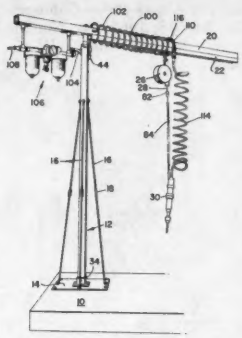
3,608,577
HOSE-HANDLING FACILITY
Walter P. Blanchard, 35 Miller Style Road, Quincy, Mass.
Filed Apr. 20, 1970, Ser. No. 30,0[illegible]
Int. Cl. B65h *75/36*
U.S. Cl. 137—355.17 **[illegible] Claims**



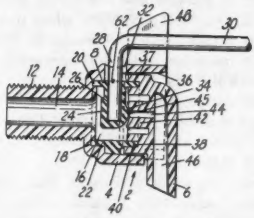
A hose-handling facility is provided for use particularly in the dockside operations involved in the transfer of liquids such as oil and gasoline, to and from a moored ship. A raised platform supports an extensible crane and also carries a bank of vertical conduits arranged in a row extending diagonally with respect to the edge of the dock. An elevated rack is disposed in spaced relation to the platform and perpendicularly with respect to the edge of the dock and by which the free ends of flexible hoses connected to the vertical conduits may be stored. Remote controls are provided adjacent the rack for operating the crane.

3,608,578
HANDTOOL-MOUNTING ASSEMBLY
Alan Martin, P. O. Box 262, Sharon, Mass.
Filed Oct. 8, 1969, Ser. No. 864,790
Int. Cl. B65h *75/36*
U.S. Cl. 137—355.24 **8 Claims**

A power tool support assembly having an overhead track for a trolley which supports a balancer on which the power tool is mounted. A retractable drive media conductor joins the tool and the supply source and is coiled about the track to supply the drive media to the tool.

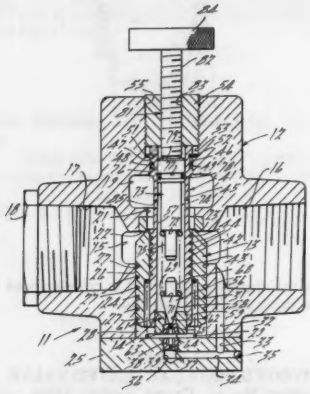


3,608,579
PIVOTED FLOAT ACTUATED VALVE
Robert Jonathan Moore, Grand Rapids, Mich., assignor to Leigh Products, Inc., Coopersville, Mich.
Filed July 21, 1967, Ser. No. 655,235
Int. Cl. F16k *31/22, 1/16;* **G05d** *9/02*
U.S. Cl. 137—448 **7 Claims**



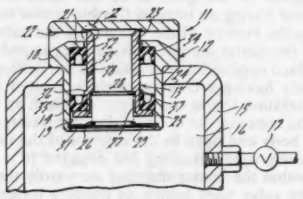
A relatively rigid valve body adapted to be fixedly supported and have a source of fluid pressure connected thereto; a passage in the body connecting the source to an open-sided chamber in the body, the wall of the chamber having an annular groove around the inner end of the passage; a relatively rigid orifice body fixedly connected to the valve body and closing the open side of the chamber and having an annular groove in its inner face opposed to the groove in the wall of the chamber; an annular valve seat of relatively flexibly deformable material having its ends in sealed and supported engagement in the grooves of the valve body and orifice body, and having an integral flexible center member projecting into the interior of the annulus of the valve seat; the surface of the center member having a segmental convex spherical surface opposed to the inside of the orifice body, the orifice body having a concave surface located in coacting adjacent relation to the convex surface, with an orifice opening from the concave surface to a director passage formed in the orifice body and open to the exterior of the orifice body; and a relatively rigid actuating bar engaged in a hole extending from within the center member outwardly through the valve seat, the valve body having an opening formed therethrough passing the actuating bar in clearing relation and providing an unsupported, noncontacted, area on the outside of the valve seat surrounding the projecting end of the actuating bar; the outer end of the actuating bar being connected to a float arm having a float on its free end, and a biasing weight adjustable along its length.

3,608,580
PILOT-OPERATED RELIEF VALVE
Conrad J. Hohmann, Grosse Pointe Woods; Clarence W. Smith, Farmington, and Ronald J. Klatt, Redford, all of Mich., assignors to Kelsey-Hayes Company
Filed Dec. 18, 1969, Ser. No. 886,257
Int. Cl. F16k *17/10*
U.S. Cl. 137—490 7 Claims



A pilot-operated relief valve having simplified construction and wherein a main valve member controls the flow through a fluid passage interconnecting first and second chambers. A third chamber is provided that is in communication with the first chamber by means of second fluid passage formed in the valve housing. The main valve member has areas exposed to the pressure in the first and third fluid chambers and is normally biased to a closed position when the pressure in these chambers is equal. A third passage is formed through the main valve member and interconnects the third fluid chamber with the first fluid chamber. A pilot valve member is supported within the main valve member and controls the flow through this third fluid passage. The pilot valve member is normally biased to a closed position and when the pressure in the third fluid chamber exceeds a predetermined value, the pilot valve member will open. The opening of the pilot valve member reduces the pressure in the third fluid chamber and the pressure in the first fluid chamber acting on the main valve member then forces it to an open position whereby flow from the first chamber to the second chamber through the first passage is permitted.

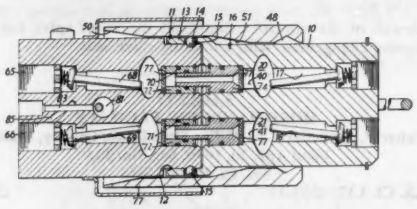
3,608,581
QUICK EXHAUST VALVE
Roger L. Sweet, Ferndale, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.
Filed Apr. 16, 1970, Ser. No. 28,994
Int. Cl. F16k *31/143*
U.S. Cl. 137—509 10 Claims



A valve for quickly exhausting a working chamber such as for a press clutch and brake actuator. A cylindrical body has a bore open to the chamber and leading to a transverse vent passage. A poppet is slidable in said body between a closed position separating the chamber from the vent, and an open position. An annular chamber is formed between the poppet and body, and a unidirectional annular seal on the poppet permits rapid filling of this chamber. A restricted passage is provided for exhausting the chamber. The valve is closed by the pressure differential across the valve sealing area, plus a spring, and is opened by pressure on said seal.

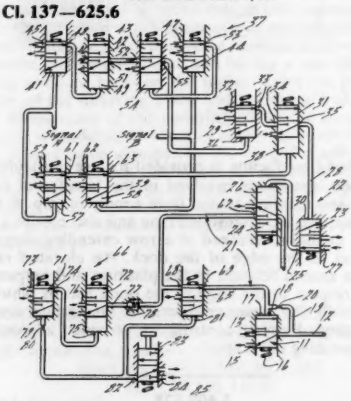
For Class 137—525.1 see:
Patent No. 3,608,676

3,608,582
VALVED FLUID COUPLING
Alfred W. Lambert, Somerset, England, assignor to Sterling Hydraulics Limited, Crewkerne, Somerset, England
Filed Sept. 4, 1969, Ser. No. 855,141
Claims priority, application Great Britain, Sept. 11, 1968, 43111/68
Int. Cl. F16k *11/10*
U.S. Cl. 137—595 20 Claims



A coupling for connecting together twin fluid lines, for example for connecting two sources of fluid pressure between a tractor and a trailer. The coupling has co-operating first and second parts each part having two fluid passages and sealing valves therein. The parts are arranged to be locked together, and means are provided for opening the valves after the two parts have been locked together, and for closing the valves before the coupling is broken.

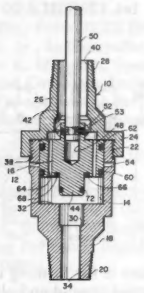
3,608,583
SIGNAL COMPARATOR FLUID CONTROL CIRCUIT WITH RESET
Andrew B. Huntington, Waterford, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.
Filed Apr. 20, 1970, Ser. No. 30,038
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.6 14 Claims



A fluid control circuit which compares the timing of two signals and shifts an output valve to an exhaust position in response to lack of synchronism between the compared signals. The circuit may be reenabled only by a reset signal pulse after the compared signals are in a similar condition. In

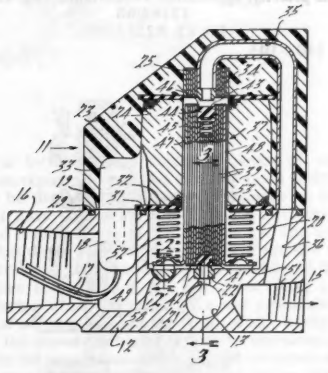
one embodiment, the circuit (other than the output valve) uses only identical normally open three-way valves. In a modified form, some pairs of normally open valves are replaced by normally closed valves.

3,608,584
FLOW CONTROL DEVICE
Charles W. Vaughn, Rte. 1, Jennings, Okla.
Filed Feb. 19, 1969, Ser. No. 800,565
Int. Cl. K16k *11/02*
U.S. Cl. 137—625.26 **7 Claims**



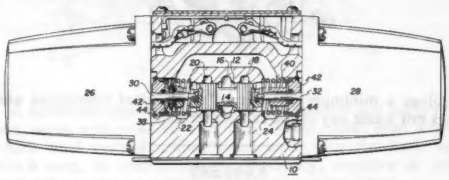
A valve having a reciprocal plunger or piston for providing alternate open and closed positions of the valve. The piston is slidably disposed within a housing having opposed inlet and outlet ports and may be moved in one direction for opening the valve to permit the flow of fluid therethrough. Movement of the piston in an opposite direction provides a first closed position of the valve wherein all flow through the valve is interrupted and there is no loss of fluid through the valve. Further movement of the piston in the closing direction provides a second closed position wherein flow of fluid through the valve is precluded and fluid trapped in the line or valve housing may be drained therefrom.

3,608,585
SOLENOID VALVE
Andrew B. Huntington, Waterford, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.
Filed Nov. 12, 1969, Ser. No. 875,994
Int. Cl. F16k *11/02, 31/02;* H01f *3/02*
U.S. Cl. 137—625.65 **8 Claims**



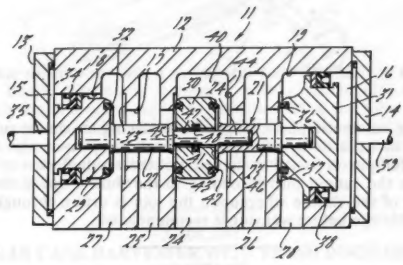
A three-way solenoid valve of the CT type in which the T-shaped armature is of laminated construction and carries inlet and exhaust valves at its opposite ends.

3,608,586
FRICTION PADS FOR NO-SPRING MODEL DIRECTIONAL VALVES
Leo T. Daggy, Jr., Birmingham, Mich., assignor to Sperry Rand Corporation, Troy, Mich.
Filed Mar. 23, 1970, Ser. No. 21,571
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.65 **3 Claims**



A solenoid-operated valve having a free-floating, sliding spool is provided with frictional detent pins radially urged inwardly by a C-shaped spring. The pins are mounted in a cartridge member having radial bores.

3,608,587
SINGLE SPINDLE FOUR-WAY VALVE
Richard P. Zbell, Birmingham, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.
Filed Aug. 6, 1969, Ser. No. 847,941
Int. Cl. F16k *11/02, 25/00*
U.S. Cl. 137—625.66 **3 Claims**

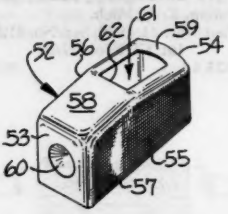


A housing has a bore with two working ports separated by an inlet port, two exhaust ports being located outside of the working ports. A spindle has a constant force applied to one end and signal pressure at the other end. Two oppositely facing poppet valves carried by the spindle engage seats disposed between the exhaust ports and the working ports. A third valve element carries two oppositely facing poppet valves engaging seats between the working ports and the inlet port. This last-mentioned element has slight play with respect to the spindle.

3,608,588
LOOM PICKER AND METHOD OF FORMING SAME
John J. Brown, 5098 Mahoning Ave., Warren, Ohio
Filed Nov. 28, 1969, Ser. No. 880,710
Int. Cl. D03d *49/36*
U.S. Cl. 139—159 **9 Claims**

A picker adapted to be positioned on the picker stick of a conventional loom and there serve to engage the nose of the shuttle as it traverses the loom. The picker comprises a plu-

rality of wraps overlying a solid core portion and a hollow collar portion, and is formed by a molding operation which



involves a minimum number of mechanical operations and does not waste any of the raw material.

3,608,589

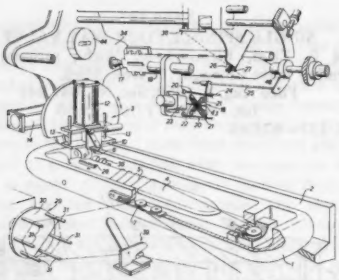
AUTOMATIC PIRN CHANGER FOR A LOOM

Benjamin Bert Taylor, Poynton, England, assignor to Associated Perforators & Weavers Limited, London, England

Continuation-in-part of application Ser. No. 723,818, Apr. 24, 1968, now abandoned. This application June 9, 1969, Ser. No. 831,409

Int. Cl. D03d *45/00, 45/02*

U.S. Cl. 139—224 **9 Claims**



An automatic pirn changer for replacing an almost runout pirn in a shuttle by a full pirn in which the yarn or wire from the full pirn is joined to that part of the residual yarn or wire from the runout pirn extending to the shuttle eye at the inside of the shuttle whereupon the join is drawn through the shuttle eye before weaving is recommenced.

3,608,590

OPTICAL WEFT STOP MOTION FOR A WEAVING MACHINE

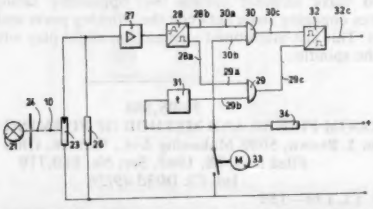
Karl Hohener, St. Gall, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Oct. 8, 1969, Ser. No. 864,690

Claims priority, application Switzerland, Oct. 10, 1968, 15134/68

Int. Cl. D03d *51/18, 51/34;* **G01n** *21/30*

U.S. Cl. 139—370 **5 Claims**



Upon occurrence of a weft yarn break the photocell is fully illuminated so that the Schmitt trigger is activated to change the state of the monostable multivibrator which thus deactivates the weaving machine. Further, in the absence of a weft yarn in the light path after picking, should the illumination of the photocell fall below a predetermined value, the voltage of the Schmitt trigger and a time network voltage are used to deactivate the weaving machine.

3,608,591

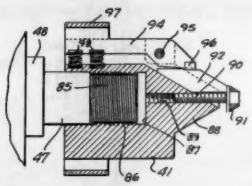
STRAND MATERIAL-GRIPING HEADSTOCK

James L. Otstot, Carlisle, Pa., assignor to Carlisle Tire and Rubber Division of Carlisle Corporation

Division of Ser. No. 416,796, Dec. 8, 1964, Pat. No. 3,438,831. Filed Jan. 8, 1969, Ser. No. 789,820

Int. Cl. B21f *3/00*

U.S. Cl. 140—92.2 **1 Claim**



The present machine is for forming convolutions of one of more strands of material around and along an extended tubular member supported and rotated by a quickly detachable selectively driven and automatically stopped mandrel on the machine and includes means for guiding said strand material to said tubular member in coordination with the rotation of said mandrel, feeds at least one of said strands at a predetermined rate while automatically compensating for any variations in the feeding speed of the strand as well as maintaining a constant tension on the strand being fed, feeds a tape around and over the strand and exposed areas of said tubular member at a proper angle and at controlled speeds to give a uniform spiral pitch and overlapping of the edges of said tape to form a wire-reinforced hose and includes a carriage driven in coordination with said mandrel carrying said strands and tape, means for feeding a liquid to the periphery of the tubular member prior to the tape thereon, means for providing a cast to one of said strands and means for preventing said cast strand from pulling out of said casting means.

3,608,592

AUTOMATIC MACHINE FOR MAKING STEEL WIRE SPRINGS

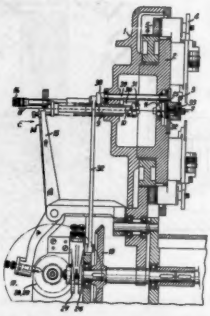
Rene Perrenoud, Rue des Sugits 14, 2114 Fleurier, Switzerland

Filed Apr. 23, 1969, Ser. No. 818,686

Claims priority, application Switzerland, Aug. 13, 1968, 12163/68

Int. Cl. B21f *35/00*

U.S. Cl. 140—103 **5 Claims**



A machine for making steel wire springs has a tray on which are mounted forming tools slidable towards the center

of the tray, means for moving the wire perpendicular to the tray, and means for clamping and cutting the wire. The means for moving the wire comprises two alternately operable clamps, one fixed and the other movable, and further includes a cylindrical member rotating in a fixed member integral with the tray. The movable member has an eccentric opening therein for the passage of the wire coacting with an eccentric opening in the fixed member and means are provided for rotating the movable member in such a way as to clamp in a first phase of operation and then cut the wire even with the opening of the fixed member in a second phase of operation.

3,608,593

METHOD OF FILLING POWDERS INTO CONTAINERS

Samuel L. McCormick, Jr., Indianapolis; John J. Burke, Indianapolis, and Arthur R. Morstadt, Speedway, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of application Ser. No. 858,541, Sept. 16, 1969, now abandoned. This application Feb. 27, 1970, Ser. No. 15,269

Int. Cl. B65b *1/04, 3/04*

U.S. Cl. 141—11 **6 Claims**

Powders are filled into bottles, ampoules, vials, syringes, and other containers by suspending the powder in an inert, volatile, liquid diluent, filling the suspension into the container, and evaporating the inert, liquid diluent, leaving the dry powder in the container.

3,608,594

CUTTING OR TRIMMING DEVICE FOR VENEERED WORKPIECES

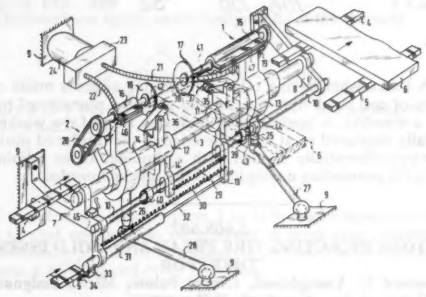
Josef Holderried, Freiburg/Breisgau, Germany, assignor to B. Raimann GmbH, Freiburg/Breisgau, Germany

Filed Nov. 7, 1969, Ser. No. 875,217

Claims priority, application Germany, Apr. 15, 1969, P 19 19 102.7

Int. Cl. B27b *5/04, 5/18*

U.S. Cl. 143—47 G **15 Claims**



A device for trimming projecting pieces of veneer on veneered workpieces comprises two saw units which are arranged to be displaced in the same direction as the workpieces and have abutments for engaging, respectively, the leading and trailing edges of the workpieces. The workpiece firstly pushes down an abutment on one of the saw units actuating a brake so that this saw unit is locked and the workpiece pushes the other of the saw units along a certain distance during which actuation of a saw automatically occurs to trim off veneer from the front of the workpiece. At the end of this travel the abutment on the entrained saw unit is allowed to be swung downwards by the workpiece so that a brake is actuated. The further movement causes the trailing edge to clear the abutment on the first-mentioned saw unit which can then rock upwards releasing the brake so that the first-mentioned saw unit is drawn along behind the workpiece and its saw cuts off veneer projecting from the rear of the workpiece.

3,608,595

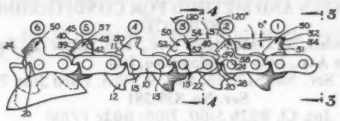
SAW CHAIN

John W. Oehrli, deceased, late of Pacific Palisades, Calif. (by Lillian M. Oehrli, executrix)

Filed July 10, 1968, Ser. No. 743,822

Int. Cl. B27b *33/14*

U.S. Cl. 143—135 **20 Claims**



A scratcher-type saw chain having scratcher and raker cutters, some with positive back rake cutter chisel edge angles which tend toward undue penetration into the kerf, and which uses, to counteract this tendency, negative to zero back rake angles on certain leading side cutter edges.

3,608,596

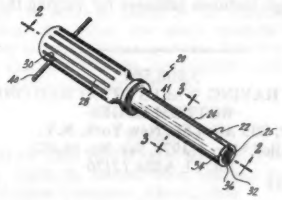
SAFETY SCREWDRIVER

Donald A. Yoho, 1306-204 Hancock Drive, Barrington, N.J.

Filed May 12, 1969, Ser. No. 823,714

Int. Cl. B25b *15/02*

U.S. Cl. 145—50 F **9 Claims**



This screwdriver has a cylindrical tube in which is a flat thin blade. The blade is formed with a rectangular edge which lies in a plane coplanar with the end of the tube. The blade is frictionally and securely fitted in diametrically opposed grooves inside the tube. The exterior of the tube has axially extending marks etched at diametrically opposed positions coplanar with the blade in the tube.

3,608,597

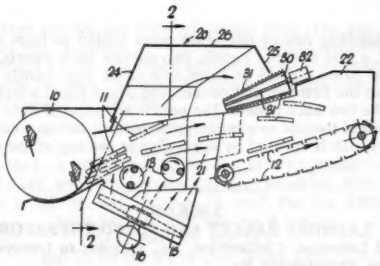
SUGAR CANE HARVESTER WITH TRASH DISCHARGE ASSISTANT

Harry R. Hill, Bundaberg, Queensland, Australia, assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 3, 1970, Ser. No. 16,117

Int. Cl. A01d *55/18*

U.S. Cl. 146—117 **6 Claims**



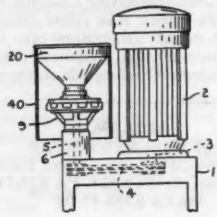
A cane harvester having a billet cutter and conveyor means to carry the billets issuing from the cutter, fan means

disposed to project an air stream upwardly through the billets to separate trash therefrom, a trash discharge opening disposed to one side of the conveyor, a power-driven toothed roller positioned adjacent a lower edge of said opening to grip trash, unusual heavy trash in particular, and propel same outwardly through said opening.

3,608,598
APPARATUS AND METHOD FOR CONDITIONING A PRODUCT

Joe R. Urschel, 202 Michigan Ave., and Edgar R. Sanders, 708 Evan Ave., both of Valparaiso, Ind.

Division of Ser. No. 512,716, Dec. 9, 1965. Filed July 7, 1969, Ser. No. 839,281
Int. Cl. B02b *5/00, 7/00;* **B02c** *17/00*
U.S. Cl. 146—225 **14 Claims**

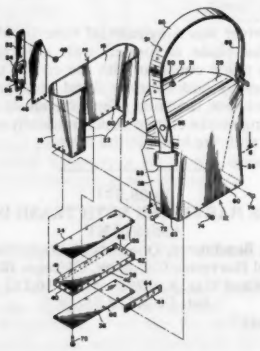


The invention primarily involves forcing a product centrifugally through tortuous passages for varying the viscosity of the product.

3,608,599
HANDBAG HAVING WALLS ATTACHED ONLY AT BOTTOM EDGES

Gladys I. Spear, 205 Allen St., New York, N.Y.

Filed Mar. 4, 1970, Ser. No. 16,452
Int. Cl. A45c *13/26*
U.S. Cl. 150—33 **10 Claims**



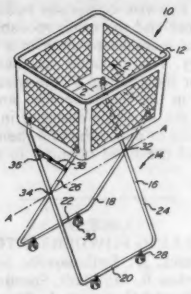
A handbag having one main piece folded to form a front panel, a first two end panels, two narrow back panels, and a second piece folded to form two other end panels which overlap the first two end panels, and a rear panel which overlaps the two back panels. The panels are secured only at bottom edges thereof to a rectangular base to define a compartment which is covered by a free flap at the top of the second piece.

3,608,600
LAUNDRY BASKET AND STAND THEREFOR

David Lehrman, Cheltenham, Pa., assignor to Ironees Company, Philadelphia, Pa.

Filed July 23, 1969, Ser. No. 844,012
Int. Cl. A45c *5/14*
U.S. Cl. 150—49 **6 Claims**

A free standing laundry basket and stand are disclosed. The stand comprises foldable legs adapted to be removably

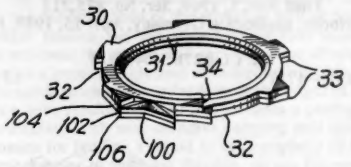


coupled to the underside of the basket, the legs serving to support the basket in an operative position.

3,608,601
THREADED LOCKWASHER AND METHOD FOR FABRICATION THEREOF

Howard C. Gohs, Syosset, N.Y., assignor to Electrical Fittings Corporation, East Farmingdale, N.Y.

Continuation-in-part of application Ser. No. 703,494, Nov. 13, 1967, now Patent No. 3,453,672. This application May 16, 1969, Ser. No. 825,382
Int. Cl. F16b *39/282*
U.S. Cl. 151—37 **7 Claims**

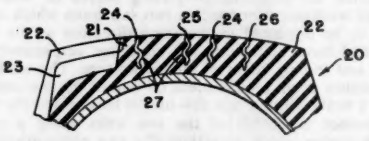


A lockwasher having tabs and gripping edges is made of a strip of coil stock material cut and wound a plurality of turns on a mandrel. A portion of at least one turn of the washer is axially displaced so at least one edge of the displaced portion is circumferentially aligned with a shoulder of an adjoining turn for preventing unwinding of the finished product.

3,608,602
STONE REJECTING TIRE TREAD AND MOLD INSERT THEREFOR

Leonard C. Youngblood, Grosse Pointe, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Filed Dec. 3, 1968, Ser. No. 780,831
Int. Cl. B60c *11/04*
U.S. Cl. 152—212 **9 Claims**



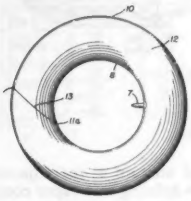
A pneumatic tire tread having traction groove formations designed to limit stone pickup and retention in service is disclosed, together with a mold insert construction therefor. Each such formation consists of increased depth groove section in one wall of which is provided an annular ridge surrounding an axial depression, and in the other wall of which is provided a registering annular channel surrounding an

axial protuberance. "Dimpled" projections of the disclosed mold insert blades are used to create the formations, each of which "dimples" has the appearance, at one face of the respective blade, of an annular ridge surrounding a central depression, and at the reverse blade face, of a central protuberance surrounded by an annular channel. Advantages are greater blade strength and easier extraction of the cured tire from the mold, as well as enhanced stone rejection.

3,608,603
INNER TUBE

Paul O. Pfeiffer, Cuyahoga Falls, and Frank J. Grucella, Akron, both of Ohio, assignors to The General Tire & Rubber Company

Filed Aug. 22, 1967, Ser. No. 662,362
Int. Cl. B60c *5/04*
U.S. Cl. 152—349 **2 Claims**



This invention relates to an improved inner tube for radial ply tires in which the ends of the tube, which are to be spliced together, lie at an acute angle with respect to the longitudinal axis of the tube.

3,608,604
EPOXY-AZIDO COMPOUNDS

David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed July 18, 1969, Ser. No. 843,230
Int. Cl. B60c *1/00;* **C08c** *11/40, 11/54*
U.S. Cl. 152—359 **1 Claim**

Disclosed are epoxy-azido compounds of the formula

$$(R'-\underset{\diagdown\,O\,\diagup}{CH}-CH)_n-R-(A-N_3)_m$$

where R is a polyvalent organic radical, R′ is a hydrogen, alkyl, cycloalkyl, aryl, or aralkyl radical, A is

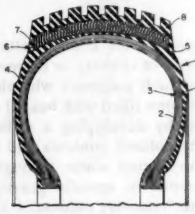
$$-O-\overset{\overset{O}{\|}}{C}- \quad \text{or} \quad -SO_2-$$

and *n* and *m* are integers from 1 to 100. Also disclosed is the use of said epoxy-azido compounds in modifying polymers, cross-linking polymers, and adhering polymers to certain substrates, e.g., glass and other polymers.

3,608,605
PNEUMATIC TIRE CONSTRUCTION

William G. Cole, 6400 Jocelyn Hollow Road, Nashville, Tenn.

Filed May 28, 1969, Ser. No. 811,563
Int. Cl. B60c *9/18*
U.S. Cl. 152—361 **17 Claims**

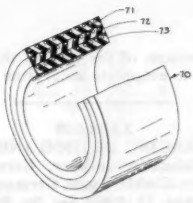


A tire construction in which continuous loops of reinforcement cords are placed in the tread portion of the tire to achieve greater tread stability and strength and provide greater resistance to tread peel.

3,608,606
RUBBER STRUCTURES CONTAINING GLASS

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation

Continuation-in-part of application Ser. No. 562,216, July 1, 1966, now abandoned. This application Dec. 29, 1969, Ser. No. 888,158
Int. Cl. B60c *9/18;* **B32b** *5/12;* **B29h** *17/28*
U.S. Cl. 152—361 **21 Claims**

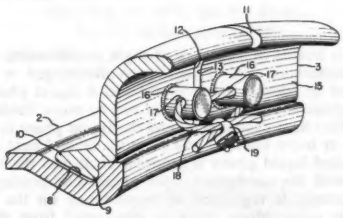


Vulcanizable elastomeric stock material in sheet, tubular and spiral form featuring interiorly thereof substantially inextensible cord assemblies in spaced relationship with each other and in aggregate defining a plane closer to one of the surfaces of the sheet or closer to the interface of the spiral member than the other; the stock material in the several forms being adapted to incorporation into tire manufacturers providing placement of the inextensible cord reinforcement in desired preselected disposition.

3,608,607
WHEEL RIM WITH SIDE RING CONNECTOR

Gerhart L. Gerbeth, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 8, 1969, Ser. No. 855,962
Int. Cl. B60b *25/20*
U.S. Cl. 152—410 **10 Claims**



A wheel rim for use with pneumatic tires. The rim has a split side ring, the ends of which are connected together by a short length of flexible cable attached to each opposed end to prevent the side ring from coming off the rim base due to radial expansion of the ring.

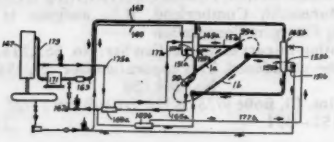
3,608,608
APPARATUS FOR CONGEALING LIQUIDS

Crosby Field, 8029 Habor View Terrace, Brooklyn, N.Y.

Division of Ser. No. 691,055, Dec. 15, 1967, Pat. No. 3,491,543. Filed Jan. 21, 1970, Ser. No. 8,118
1970, Ser. No. 008,118
Int. Cl. B01g ; B01d *1/00;* **F25d** *3/02*
U.S. Cl. 159—1 **4 Claims**

Congealing apparatus is disclosed which is particularly suited for freezing ice and congealing liquid products. There are two refrigerated plates over which a steel belt passes in two runs at an angle to the horizontal. A heat conducting

lubricant is supplied beneath the belt as it starts along each run. A special arrangement is provided for removing ;the



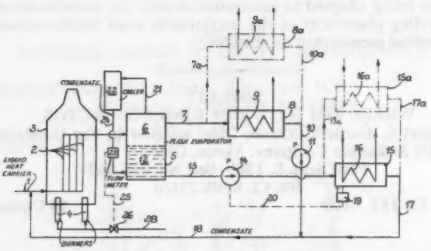
lubricant at the bottom of the path of the belt and special means is provided to evaporate water from the lubricant.

3,608,609

HEAT-EXCHANGING METHOD AND APPARATUS

Franz Trefny, Gelsenkirchen-Buer, Germany, assignor to Heinrich Koppers GmbH, Essen, Germany

Filed Aug. 21, 1969, Ser. No. 851,883
Claims priority, application Germany, Aug. 24, 1968, P 17 51 958.3
Int. Cl. B01d *1/28*
U.S. Cl. 159—2 R **6 Claims**



Water is heated in a furnace at slight overpressure to saturation temperature and is thereupon discharged in a flash evaporator to form a vapor phase and a liquid phase. The gaseous phase is employed to heat one or more fluids in one or more first heat exchangers, and the liquid phase is used to heat one or more fluids in one or more second heat exchangers. Cooled liquid phase is pumped back into the furnace, together with the condensed vapor phase. The heating action in the furnace is regulated in dependency on the rate at which the vapor phase must be evacuated from the flash evaporator to maintain the pressure therein at exchangers. constant value, and the rate at which the liquid phase is caused to flow through the second heat exchanger or exchangers is a function of temperature in such heat exchangers.

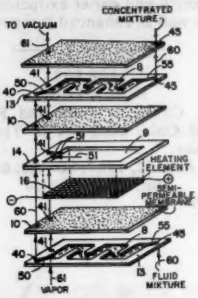
3,608,610

APPARATUS FOR EVAPORATIVE SEPARATION OF LIQUIDS THROUGH MICROPOROUS PANELS

John L. Greatorex, Marblehead, and Dirk M. De Winter, Cambridge, both of Mass., assignors to Ionics, Incorporated, Watertown, Mass.

Filed Oct. 1, 1969, Ser. No. 862,767
Int. Cl. B01d *1/22*; C02b *1/74*; B01d *23/00, 13/00*
U.S. Cl. 159—13 **6 Claims**

A membrane permeation apparatus for removing one or more components from a fluid mixture comprising a plurality of two compartment units, each compartment defined by semipermeable membranes, wherein the first compartment is the fluid mixture feed compartment and the second a vapor compartment which is maintained under a partial vacuum, the latter having heating means therein for vaporizing a component of the fluid mixture at the adjacent semipermeable membrane surfaces defining said vapor compartment.

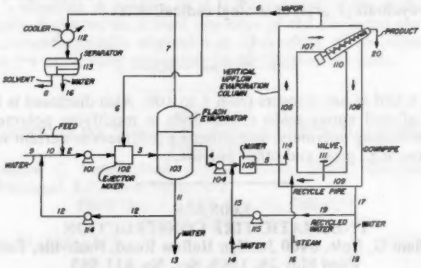


3,608,611

METHOD FOR RECOVERING A RUBBERLIKE HIGH MOLECULAR WEIGHT POLYMER

Teruo Oshima, 7-17, Oide-cho, Nishinomiya; Mamoru Asada, 6-546, 2-chome, Ikku-cho; Kazu Baba, 6-317, 2-chome, Ikku-cho; Shinichi Arakawa, 9, 1-chome, Yushudai-nishi, and Akira Miyashita, 29-7, 2-chome, Oike, Ibaraki, all of Japan

Filed Sept. 22, 1969, Ser. No. 859,840
Claims priority, application Japan, Sept. 21, 1968, 43/68583
Int. Cl. B01d *1/00*
U.S. Cl. 159—47 **5 Claims**



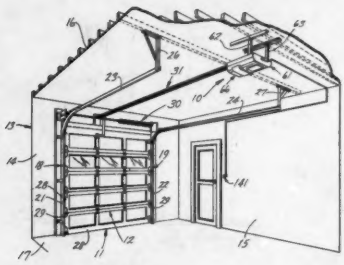
Method and apparatus for concentrating an organic solvent solution or slurry of rubbery or thermoplastic polymers, and for recovering such polymers wherein the solution or slurry is fed to a column filled with heated water, the solvent is evaporated, thereby developing a difference in specific gravity between the column contents and the heated water, and circulating the heated water through the column by utilizing the difference in specific gravity. The apparatus comprises a polymer recovery column, a downpipe, a vessel connecting the upper part of the polymer recovery column with the downpipe, and a pipe connecting the intermediate part or the lower part of the column with the downpipe.

3,608,612

DOOR OPERATOR

Paul E. Pemberton, Dallas, and Sheldon D. Loose, Carrollton, both of Tex., assignors to Overhead Door Corporation, Dallas, Tex.

Filed Sept. 10, 1969, Ser. No. 856,555
Int. Cl. E05f 15/16
U.S. Cl. 160—188 10 Claims



A door operator mounted upon an elongated rail and adapted to open and close an upwardly acting door having horizontally hinged sections supported on tracks. An elongated, helical spring extends lengthwise within the rail and is rotated by drive means mounted on the rail. A traveling nut is engaged with the helical spring and is connected to the door so that rotation of the helical spring causes the traveling nut to move lengthwise of the track to operate the door. Switch means are responsive to the compression and expansion of the spring to deenergize the drive means.

3,608,613

SLIDING DOOR

Keith Halliwell, Brookvale, New South Wales, Australia, assignor to Frantz Manufacturing Co., Sterling, Ill.

Filed May 8, 1969, Ser. No. 823,095
Claims priority, application Australia, May 15, 1968, 37857/68
Int. Cl. E06b 3/14, 3/22
U.S. Cl. 160—229 6 Claims

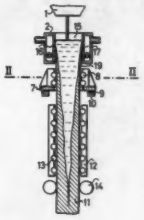
A sliding door formed from a plurality of panels hingedly connected transversely to the direction of sliding.

3,608,614

SUPPORT MEMBER FOR CASTING IN CONTINUOUS CASTING OPERATION

Walter Meier, Winterthur, and Peter J. Koenig, Zumikon, both of Switzerland, assignors to A. G. Concast, Zurich, Switzerland

Filed Mar. 19, 1968, Ser. No. 714,313
Claims priority, application Switzerland, Mar. 22, 1967, 4243/67
Int. Cl. B22d 11/12
U.S. Cl. 164—83 3 Claims



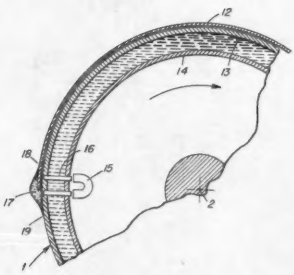
In a continuous casting plant, a carrier member is positioned between and supports the casting as it passes from the outlet of the mold to the casting guideway. The carrier member is arranged to move linearly and rotatably in a plane generally normal to the longitudinal path of movement of the casting for adjusting to any uneven cooling within the mold which causes the casting to deflect from its normal path of movement. If uneven cooling exists within the mold, means are provided for displacing the carrier member to correct the uneven cooling condition.

3,608,615

FOIL PRODUCTION

John J. Conlon, Westfield, N.J., assignor to Phelps Dodge Corporation, New York, N.Y.

Filed Aug. 20, 1970, Ser. No. 65,422
Int. Cl. B22d 11/06, 11/08
U.S. Cl. 164—87 9 Claims

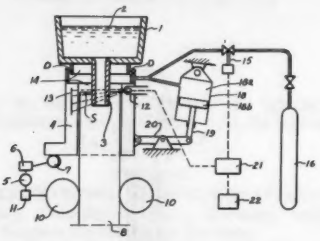


Vaporized material is condensed and solidified on the surface of a revolving drum from which the material is stripped as a foil. A leader or starter sheet is temporarily magnetically retained on the drum and extended to a takeup means to aid in starting continuous deposition and stripping. Electron beams are employed in various ways to vaporize the material.

3,608,616
CONTINUOUS CASTING APPARATUS WITH PRESSURE EQUALIZATION CHAMBER

Ralf Schneider, Metzkausen, Germany, assignor to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed Mar. 19, 1969, Ser. No. 808,555
Claims priority, application Germany, Mar. 22, 1968, P 17 58 027.7
Int. Cl. B22d 11/02
U.S. Cl. 164—154 5 Claims

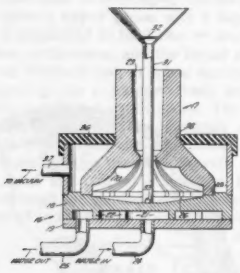


Continuous casting apparatus in which the mold oscillates and the space above the melt in the mold is enclosed and connected to an equalization chamber. Oscillation of the mold varies the volume and thereby the pressure in the space above the melt and the equalization chamber has variable volume means for substantially compensating the volume change in the space above the melt and thereby maintaining a substantially constant pressure in the space above the melt as the mold oscillates.

3,608,617
ART OF MAKING PRECISION CASTINGS

Clarence J. Burke, Rolling Hills Estates, and Milton O. Grosjean, Los Angeles, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 551,256, May 19, 1966, Pat. No. 3,435,885.
Filed Nov. 29, 1968, Ser. No. 794,462
Int. Cl. B22d 7/10, 27/04
U.S. Cl. 164—126 3 Claims

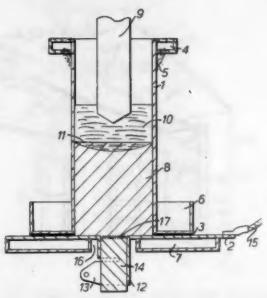


A method for casting in a founding flask in which molten metal is continuously poured below the surface of the previously added molten metal through a heated funnel which extends to the lower portion of the flask and meters the flow of molten metal into the flask. Heat is removed through the lower portion of the flask while heat is prevented from escaping through the upper portion. The exterior of the upper portion of the flask may be evacuated during the pouring of the molten metal.

3,608,618
ELECTROSLAG INGOT PRODUCTION

Peter Thomas Reginald Maskall, Birmingham, England, assignor to Associated Electrical Industries Limited, London, England

Filed Jan. 30, 1968, Ser. No. 701,653
Claims priority, application Great Britain, Feb. 7, 1967, 5847-67
Int. Cl. B22d 27/02
U.S. Cl. 164—252 8 Claims

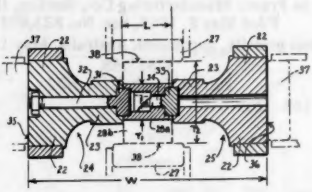


The electroslag process of ingot production in a mould is improved by providing bottom contact to the ingot via a stub or spigot provided at its bottom end.

3,608,619
CONTINUOUS CASTING STARTER BAR

Georg Bollig, Buderich, Germany, and Eric T. Vogel, Elmhurst, N.Y., assignors to Concast Incorporated, New York, N.Y.

Filed Mar. 10, 1969, Ser. No. 805,628
Int. Cl. B22d 11/08
U.S. Cl. 164—274 11 Claims



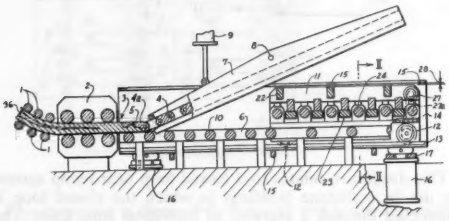
In a dummy bar having a head for temporarily plugging a continuous casting mold, the cross-sectional dimensions of links of a chain, which is removably attached to the dummy bar head, are adjustable so that the ends and sides of the links will be supported and guided by the rollers of the roller apron of the casting apparatus when the cross-sectional shape and dimensions of the roller apron are changed to correspond to the shape and dimensions of beam blank and slab molds of different sizes. The links have the cross-sectional shape of the smallest beam blank and are in two halves separable at a break laterally across the web portion and held together by removable tie rods. Inserts are mounted between the halves to adjust the width; the thickness of the inserts determines the adjustment for the thickness of the web of a beam blank. For slabs the rollers of the roller apron engage the flanges of the beam blank shape of the web. A storage rack for the dummy bar chain is adapted to support and and to separate the halves of all the links at once for inserting, removing or exchanging the inserts.

3,608,620

APPARATUS FOR GUIDING A STRAIGHTENED STRAND IN A CONTINUOUS CASTING MACHINE

Georg Bollig, Buederich; Horst Grothe, Kaarst, Germany; Walter Meier, Winterthur, and Josef Zeller, Weesen, Switzerland, assignors to Schloemann Aktiengesellschaft, Dueseldorf, Germany

Filed Dec. 15, 1969, Ser. No. 884,820
Claims priority, application Germany, Dec. 13, 1968, P 18 14 662.8; Switzerland, Feb. 20, 1969, 2571/69
Int. Cl. B22d *11/08*
U.S. Cl. 164—274 15 Claims



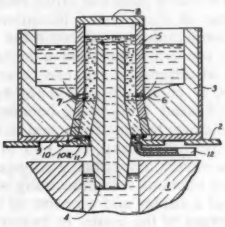
In a continuous casting machine a strand having a solidified shell and a liquid core moves onto a roller table and a dummy bar attached to the head end of a strand is detached from the strand and removed from the path of the strand, or is inserted into the strand path in the machine, at a point in the area of said roller table. Dummy bar storage apparatus has an end portion movable into and out of the path of a strand at said point for the insertion or removal of a dummy bar. As disclosed, the machine includes guide apparatus for supporting a strand moving onto the roller table by support means for engaging and supporting at least two opposite sides of a strand to resist bulging due to ferrostatic pressure in the strand core. The guide apparatus includes at least one movable guide unit, which is movable away from said point to provide clearance for the end portion of the dummy bar storage apparatus to move into the strand path at said point for inserting or removing a dummy bar, and which is movable toward said point, when the latter end portion is out of the strand path, so that the guide apparatus engages and supports a strand at said point.

3,608,621

CONTINUOUS CASTING APPARATUS WITH CONTROLLED OVERFLOW CASTING TUBE IN TUNDISH

Georg Bollig, and Kristof Tromel, both of Buederich, Germany, assignors to Schloemann Aktiengesellschaft, Dusseldorf, Germany

Filed Apr. 27, 1970, Ser. No. 32,102
Claims priority, application Germany, Apr. 29, 1969, P 19 21 808.7
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 8 Claims



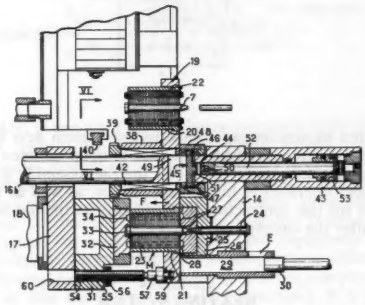
In a method and apparatus for controlling the flow of molten metal from a tundish into a continuous casting mold a casting tube is provided in the tundish opening through the bottom thereof with a rising tube around the casting tube extending above the upper end of the casting tube and above the level of molten metal in the mold. Openings in the walls of the rising tube let metal into it from the tundish. A gas, preferably inert, is fed into the rising tube to mix metal to rise up and overflow into the casting tube and down into the mold.

3,608,622

MACHINE FOR MOULDING UNDER PRESSURE METAL CONNECTING MEMBERS OF ROTORS OF ELECTRIC MOTORS

Rene Georges Bachelier, Paris, France, assignor to Ateliers de Constructions Mecaniques et de Chaudronnerie Corpet-Louvet & Cie, La Courxneuve, France

Filed Jan. 6, 1969, Ser. No. 789,191
Claims priority, application France, Jan. 9, 1968, 135,272
Int. Cl. B22d *19/00, 17/24*
U.S. Cl. 164—303 13 Claims



The invention provides a machine for moulding under pressure short-circuiting bars and rings of rotors of electric motors formed initially from a stack of magnetic sheets formed with connecting apertures, the machine having a rotatable carrier member fitted with two diametrically opposed sleeves each adapted to receive a stack of sheets, rotation of the carrier member repeatedly through 180° presenting one sleeve to a feed hopper for the stacks and the other to a pair of opposed moulding dies which, when pressed against the end faces of the sleeve, form with the sleeve a complete mould into which is injected under pressure liquid metal which passes into and through the connecting apertures in the stack and into recesses in the dies to form rings on the end faces of the stack continuing from the apertures to form with the stack an assembled rotor which is then removed from the sleeve.

3,608,623

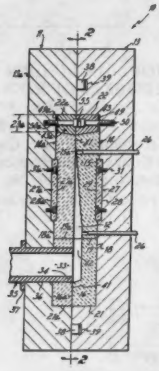
WEDGE-SHAPED CHOCK MEANS FOR LOCKING IMPRESSION BLOCKS OF A DIE ASSEMBLY

Joseph A. Woltering, Hamilton, Ohio, assignor to Hamilton Die Cast, Inc., Hamilton, Ohio

Continuation of application Ser. No. 737,480, June 17, 1968, now abandoned. This application Mar. 13, 1970, Ser. No. 19,240
Int. Cl. B22d *17/00*
U.S. Cl. 164—339 4 Claims

An expansion-gap-compensating system for a die that is especially useful in the area of high-temperature diecasting, e.g., at temperatures of about 1,300° F. and up. When a die's impression block is fabricated of a metal having a different expansion coefficient than that of the die's holding block crevasses or expansion gaps tend to open between the two blocks upon heating of the die assembly to high temperature from room temperature. The width of these expansion gaps is mainly dependent on the difference in expansion coefficients of the block metals and on the casting or operating temperature. The system of this invention permits an impression block and a holding block fabricated of, for example, a

refractory metal and a steel respectively, (a) to be simply and easily assembled and maintained together as a die in tight and safe operating relation without damage to either, and (b) to be maintained in an exact centered or preset position relative one to another, at all times throughout a casting run.



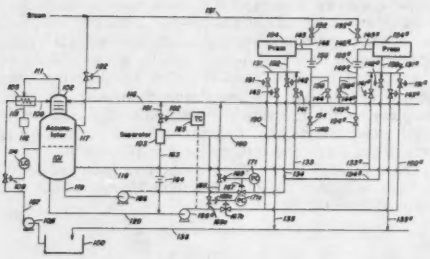
Thus, the expansion-gap-compensating system acts to compensate for expansion gaps that tend to open between related impression and holding blocks as the die assembly is heated up to and operated at high temperatures, as well as to compensate for the contracting of those gaps as the die assembly cools after the casting run.

3,608,624

HEATING SYSTEM

Floyd Hasselriis, Astoria, N.Y., assignor to American Hydrotherm Corporation

Filed Mar. 2, 1970, Ser. No. 15,384
Int. Cl. B60h *1/00*
U.S. Cl. 165—1 **16 Claims**



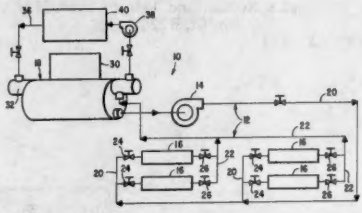
An industrial heating system, in particular a system for providing high-temperature high-pressure water to the mold cavity of a tire press, to maintain desired temperature conditions during a curing cycle. A single accumulator provides the high temperature water requirements and in a typical cycle the mold cavity is filled with high temperature water from the accumulator, preferably through a separate fill line under the driving force of high pressure steam which also maintains the desired water fill temperature. During the curing, water is pressurized and circulated through the mold cavity and returned to a gas-liquid separator to provide for continuous degasification of the water. The temperature of the liquid is maintained at the desired operating temperature by splitting the flow of water from the gas-liquid separator between the accumulator and the mold cavity, with there being an increase in flow to the accumulator in response to a decrease in temperature below the desired operating temperature to provide additional high temperature water to the circulating system and vice versa.

3,608,625

CLOSED LOOP HEAT PUMP SYSTEMS

Garland L. Kendrick, Arlington, Va., assignor to The Singer Company, New York, N.Y.

Filed Oct. 28, 1969, Ser. No. 871,832
Int. Cl. F24f *3/00*
U.S. Cl. 165—22 **2 Claims**



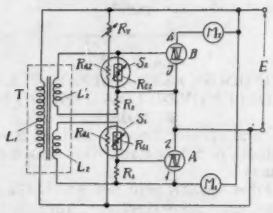
This disclosure relates to a closed loop heat pump system for use in multizone buildings in which the closed loop is connected through a plurality of individual zone units. The zone units are heat pumps of the type which include reversible refrigerating apparatus. The closed loop circulates a heat exchange media through the individual zone units wherein heat may be absorbed or rejected and maintains a predetermined temperature level by adding or removing heat from the heat exchange media at a temperature control center or storage vessel equipped to heat or cool the heat exchange media of the closed loop.

3,608,626

APPARATUS FOR AUTOMATICALLY ADJUSTING ROOM TEMPERATURES

Mikio Yamazaki, and Naomasa Sunano, both of Ayabe, Japan, assignors to Shinyei Co., Inc., Ikuta-ku, Kobe, Japan

Filed Jan. 2, 1970, Ser. No. 215
Claims priority, application Japan, Jan. 7, 1969, 44/1611
Int. Cl. F25b *29/00*
U.S. Cl. 165—26 **4 Claims**



This invention relates to an apparatus for obtaining suitable room temperatures according to every change of season, the environs of working places or office rooms.

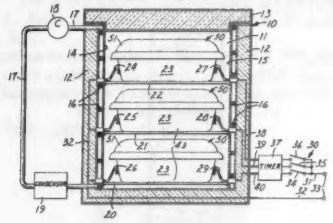
The apparatus of the present invention consists of two heat-sensitive semiconductors showing the characteristics of transition of a semiconductor and a metal phase and two heating bodies of different resistance values attached to the semiconductors to constitute two heater-type heat-sensitive elements, each heating body being connected to an electric source, so as to cause heating from said heating body on one hand, and on the other hand, one end of each of the two heat-sensitive semiconductors being connected to the gate of a silicon-control element communicating with a load, namely, the circuit of a cooler and a heater so that the indirectly heated temperature of the cooler or heater can be automatically adjusted by determining the actuating point of the heat-sensitive bodies, namely, the range of changes in room temperature, due to the adjustment of electric current flowing in the circuit of the heating bodies.

3,608,627

DEVICE AND METHOD FOR COOKING FOODSTUFFS IN A FROZEN ENVIRONMENT

Thomas S. Shevlin, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Dec. 4, 1968, Ser. No. 781,157
Int. Cl. F25b *13/00*
U.S. Cl. 165—2 9 Claims



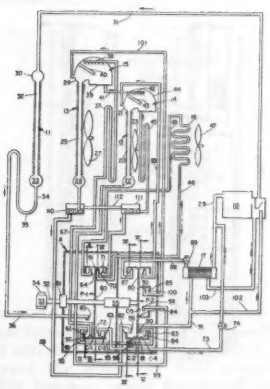
This invention is directed to a device and system for cooking foods from a refrigerated or a frozen state to an edible state directly in the refrigerated or frozen environment. One or more cooking receptacles or casseroles containing foodstuffs are placed in a chamber maintained at desired refrigerated temperatures. A thermally insulated electric heating element either integrally formed with each receptacle or in direct contact therewith is connected to an electric circuit for the purpose of heating or cooking the food. The receptacles are thermally insulated and have a dish member on which the food is placed. In most systems it is preferred that the dish has a low heat capacity and high heat transfer characteristics so that substantially all of the heat produced by the element is transferred through the dish directly into the food. The heating elements of the casseroles are controlled by the circuit so that each casserole or a group of casseroles may be selectively energized to cook or heat the food while the chamber remains at refrigerated or freezing temperatures and the remaining nonenergized casseroles are retained in frozen or refrigerated condition.

3,608,628

HEATING AND COOLING SYSTEM

Louis H. Leonard, Jr., Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 18, 1970, Ser. No. 20,772
Int. Cl. F25b *13/00, 15/06*
U.S. Cl. 165—62 5 Claims



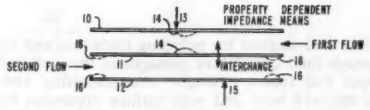
An absorption refrigeration system having a cooling and a heating mode of operation. A generator, an air-cooled condenser, a two-stage air-cooled absorber, a two-stage adiabatic evaporator and an air-conditioning heat exchanger are connected to provide cooling. A heating mode of operation is provided wherein absorbent solution is heated in the generator and passed through the heat exchanger back to the generator to supply heat to a space being conditioned. The system embodies a plural trough solution scoop pump and a plural trough refrigerant or chilled water scoop pump mounted on a single shaft and driven by a single reversible motor to effect a change from cooling to heating and return.

3,608,629

FLOW COMPENSATOR FOR EXCHANGER APPARATUS

Kenneth W. Cowans, Los Angeles, Calif., assignor to Sub-Marine Systems Incorporated

Filed Feb. 3, 1969, Ser. No. 795,922
Int. Cl. F28d *9/00*
U.S. Cl. 165—165 13 Claims



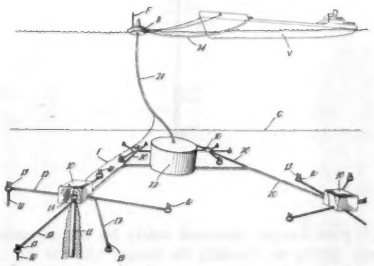
A system is provided for achieving extremely high efficiencies in counterflow heat exchangers having multiple passageways, despite unavoidable passageway variations due to manufacturing tolerances and other causes. The individual passageways are configured with selected cross-sectional variations in dimension disposed in selected fashion along their lengths. These variations cause flow impedance of the passageways to vary in response to temperature differences of the flowing gases, and are arranged to act in compensatory senses, so that the temperatures are equalized. It is shown that adequate compensation is achieved to normalize flows and minimize temperature differentials between counterflowing fluids and adjacent passageways, thus to provide an optimized heat transfer effectiveness.

3,608,630

OFFSHORE OIL PRODUCTION METHOD AND APPARATUS

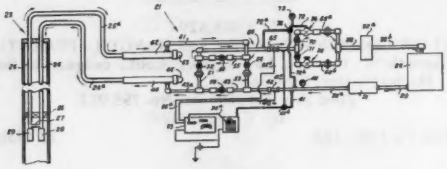
Bruce J. Wooden, Rockville, and Alan M. Bieber, Potomac, both of Md., assignors to Ocean Systems, Inc., New York, N.Y.

Filed Dec. 16, 1968, Ser. No. 783,945
Int. Cl. E21b *43/01*
U.S. Cl. 166—.5 2 Claims



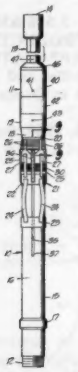
Offshore oil production system wherein one or more buoyant enclosures are submerged adjacent the ground and serve as sites for manifolding the oil produced from a plurality of wells. The enclosures contain equipments for separating the gas from the oil. The oil, after separation of gas, is transferred from the enclosures to a common oil storage vessel where it is stored prior to transmission to shore.

3,608,631
APPARATUS FOR PUMPING TOOLS INTO AND OUT OF A WELL
Phillip S. Sizer, Dallas, and Harry E. Schwegman, Richardson, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.
Filed Nov. 14, 1967, Ser. No. 682,874
Int. Cl. E21b *33/05, 41/00*
U.S. Cl. 166—70 40 Claims



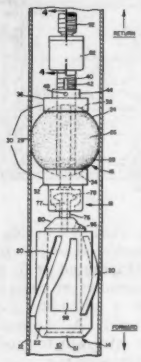
A system and method for pumping tools into and out of a well through fluid circulation passages in the well including fluid input and return passages communicating with each other in the well bore and with surface apparatus for controlling fluid flow through said passages. The surface apparatus includes a manifold system for directing flow through the well circulation passages in either direction and includes variable choke means in the fluid return portion of the manifold for a controlled back pressure on the well passages and pressure and flow rate measuring means for monitoring fluid flow in the well passages.

3,608,632
WELL PIPE HANGER
James R. Solum, Huntington Beach, Calif., assignor to B & W Incorporated, Torrance, Calif.
Filed Nov. 21, 1969, Ser. No. 878,792
Int. Cl. E21b *23/00, 43/10*
U.S. Cl. 166—124 17 Claims



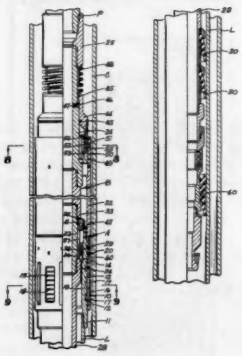
A well pipe hanger operated solely by reciprocation for selectively setting or releasing the hanger wherein the casing-engaging wedge slips are supported on a slidable assembly having frictional engagement with the casing with the wedge slips normally in an inoperative position for running the well pipe into the well and the wedge slips are urged outwardly to an operative position by an actuating ring upon substantial upward movement of the hanger whereby downward movement of the hanger then causes the wedge slips to engage and be expanded by a frustoconical surface into casing-engaging relationship for hanging the well pipe. Subsequent upward movement of the hanger releases the wedge slips from casing engagement and returns the wedge slips to their inoperative position for any additional desired downward travel of the well pipe.

3,608,633
WELL TUBE SCRAPING TOOL
William A. Talley, Jr., Dallas, Tex., assignor to Mobil Oil Corporation
Filed Sept. 17, 1969, Ser. No. 858,659
Int. Cl. F21b *33/16;* F21b *37/02*
U.S. Cl. 166—153 9 Claims



A piston section of a TFL tool having an elastic substantially spherical sealing member is serially connected through a ball-and-socket flexible coupling to a scraper section having radially extending scraper blades. Clamping members located on opposite sides of the sealing member may be moved with respect to one another along the axis of the TFL tool to adjust the diameter of the sealing member by varying the axially compressive forces on the sealing member.

3,608,634
HYDRAULIC SET LINER HANGER
Chudleigh B. Cochran, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.
Filed Mar. 19, 1970, Ser. No. 21,122
Int. Cl. E21b *43/10;* F21b *33/129*
U.S. Cl. 166—208 7 Claims



A liner hanger employing a hydraulically actuated setting tool structure which is removable substantially entirely after setting of the hanger leaving a minimal amount of hanger

structure in the well. A dog-type latch provides an improved releasable connection between the setting tool and the hanger and a reset spring is provided in the event of premature setting of the hanger to enable release of the hanger for movement to the desired location.

3,608,635

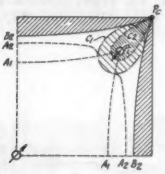
INTERFACE ADVANCE CONTROL IN SECONDARY RECOVERY PROGRAM BY RETARDING CUSP FORMATION AND RESHAPING OF THE INTERFACE BETWEEN DRIVING AND DRIVEN FLUIDS BY THE USE OF A DYNAMIC GRADIENT BARRIER

Donald L. Hoyt, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 786,565, Dec. 24, 1968, and a continuation-in-part of 786,568, Dec. 24, 1968. This application June 30, 1969, Ser. No. 837,520

Int. Cl. E21b *43/20, 43/22*

U.S. Cl. 166—245 **23 Claims**



The interface between driving and driven fluids in a secondary recovery operation is retarded and/or reshaped after a cusp has developed by injection of fluids via wells controlling the advance of flow gradients and to delay the arrival of the injected driving fluid into the vicinity of a production well by the imposition of a dynamic gradient barrier of produced hydrocarbon fluids to spread the interface.

3,608,636

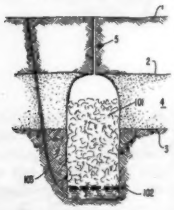
BENEFICIATION OF GEOLOGICAL FORMATIONS BY MEANS OF UNDERGROUND NUCLEAR DETONATIONS AND THE UTILIZATION OF WATER IN CONJUNCTION THEREWITH

Rod P. Dixon, Salt Lake City, Utah, assignor to American Oil Shale Corporation, Salt Lake City, Utah

Continuation-in-part of application Ser. No. 541,810, Apr. 11, 1966, now abandoned , and a continuation-in-part of 734,661, June 5, 1968. This application Jan. 30, 1969, Ser. No. 795,190

Int. Cl. E21b *43/00*

U.S. Cl. 166—247 **10 Claims**



When a nuclear explosive device is detonated underground in a geological formation, an extraneous liquid such as water is introduced into the resulting fragmented area of the formation to upgrade the quality of fluid products withdrawn therefrom. For instance, water introduced into a chimney formed by underground nuclear detonation in a natural gas field may be used to remove water soluble radioactive contaminants from the gas to be produced from the formation. In another embodiment, the radioactivity of a water supply which is to be accumulated underground in a nuclearly detonated reservoir may be reduced to an acceptable level by introducing an initial volume of water into the fragmented formation about and above the point of detonation in an early stage of the accumulation process such that this water would scrub radioactive contaminants from the detonated formation and the contaminated water consequently accumulating in such early stage following detonation is removed before accumulation of substantially pure water is begun.

3,608,637

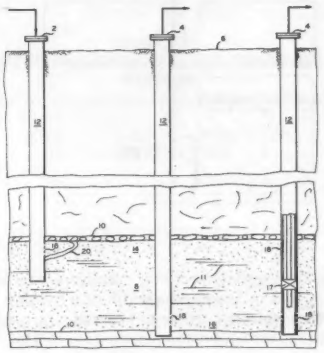
IN SITU COMBUSTION PRODUCTION METHOD

William B. Lumpkin, Morichal, Venezuela, and Robert F. Meldau, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Nov. 12, 1969, Ser. No. 875,672

Int. Cl. E21b *43/24*

U.S. Cl. 166—256 **5 Claims**



An improved in situ combustion production method wherein the combustion zone is established within the upper portion of the producing formation and fluids are produced from the formation in such a manner as to maintain the combustion gases within the formation.

3,608,638

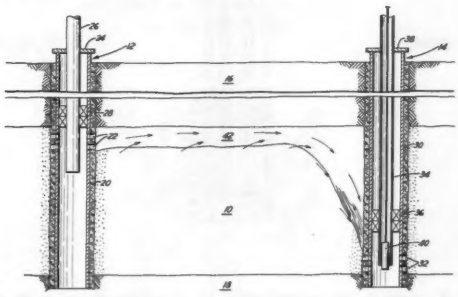
HEAVY OIL RECOVERY METHOD

Paul L. Terwilliger, Fox Chapel Borough, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 23, 1969, Ser. No. 887,613

Int. Cl. E21b *43/24*

U.S. Cl. 166—272 **1 Claim**



A hydrocarbon solvent such as benzene, platformate, or kerosene at a temperature in the range of 300° to 700° F. is injected into the top of tar sands at an injection well and forced through the formation to an adjacent production well.

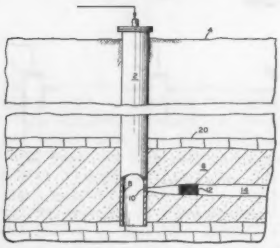
Injection of the solvent and production of oil are continued to maintain a gaseous phase across the top of the formation. The tar sand oil is made more mobile as a result of heating and dissolution of the solvent into the oil whereby the oil drains into the production well and is lifted to the surface.

3,608,639

METHOD OF FRACTURING WITH POPCORN POLYMER

Frank L. Hart, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Jan. 19, 1970, Ser. No. 3,900
Int. Cl. E21b *43/26*
U.S. Cl. 166—308 **8 Claims**



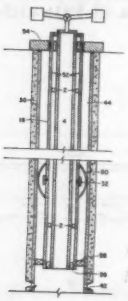
A method for exerting forces on a subterranean formation for fracturing and increasing the width of a fracture wherein polymerizable materials capable of forming popcorn polymer are placed in the formation and polymerized in situ.

3,608,640

METHOD OF ASSEMBLING A PRESTRESSED CONDUIT IN A WALL

Glen Paul Willhite, and William L. Martin, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Oct. 20, 1969, Ser. No. 871,240
Int. Cl. E21b *17/00, 43/24*
U.S. Cl. 166—315 **6 Claims**



A method of constructing in a subterranean well a prestressed conduit for conveying heated fluids wherein there is positioned in the well bore two concentric tubing strings having support elements in the annular space therebetween. The annular space is sealed at one end by attaching the tubing strings together. The inner tubing is then elongated and the annulus sealed at the other end thereof.

3,608,641

PREPARATION OF FIRE-EXTINGUISHING MATERIAL BY HEATING DICYANDIAMIDE WITH ALKALI METAL CARBONATES OR BICARBONATES

Arnold George Cottrell, Winnington, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 7, 1969, Ser. No. 797,671
Claims priority, application Great Britain, Mar. 1, 1968, Mar. 1, 1968, 10125;10126
Int. Cl. A62c *1/08*; A62d *1/00*
U.S. Cl. 169—1 **4 Claims**

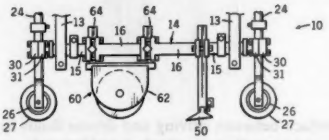
Preparation of powdered fire-extinguishing compositions by heating dicyandiamide with alkali metal carbonates or bicarbonates at 160° C.–180° C., preferably in approximately equimolar proportions, and subsequently powdering the products.

3,608,642

FIELD CULTIVATOR

John F. Culp, Rte. 1, Box 163, Bell City, Mo.

Filed Mar. 13, 1969, Ser. No. 807,062
Int. Cl. A01b *33/02, 33/14*
U.S. Cl. 172—62 **7 Claims**



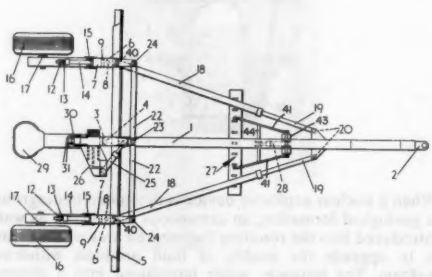
The field cultivator provides support for a cross cultivator unit which comprises a rotative drum mounting a plurality of spring-loaded rake members actuated by a cam member fixed to support means. The cam member engages the orbiting rake members to induce alternating priming and raking stroke of the rake members as the drum rotates. Associated wheels of the field cultivator are linked by synchronizing mechanism to assure alignment of the cross cultivator unit and turning control of the unit as a whole.

3,608,643

GRADING MACHINES

John Reginald Flood, Chester, and John Barr Rogerson, Mynydd-Isa, near Mold, both of England, assignors to Universal Graders Limited, Pentre, Queensperry, Deeside, Flintshire, Great Britain

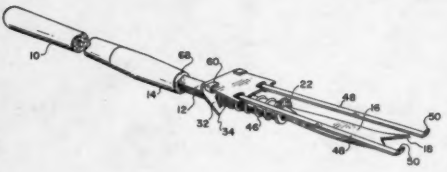
Filed Feb. 10, 1969, Ser. No. 797,878
Claims priority, application Great Britain, Feb. 12, 1968, 6778/68
Int. Cl. A01b *49/02, 63/16, 65/04*
U.S. Cl. 172—200 **9 Claims**



A machine, particularly a grading machine, comprising a draw bar having a tool support depending therefrom through

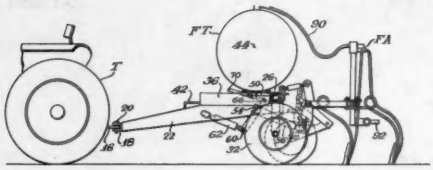
a vertical pivot to enable angling of the support, a grading blade or other tool is carried on the front of the support which has a pair of wheels attached to a beam at the rear thereof; the blade or other tool can be raised and lowered as well as angled and the wheels can be steered by an operator sitting on a seat behind the tool support.

3,608,644
WEEDING TOOL
Edward B. Ambrose, 103 Mayfair Place, Chicago Heights, Ill.
Filed Aug. 12, 1969, Ser. No. 849,328
Int. Cl. A01b *1/16*
U.S. Cl. 172—378 **8 Claims**



A tool is disclosed for digging weeds having a handle member with a root-cutting and extracating blade at one end with a pair of spaced spring tines held adjacent to and spaced from the cutting blade from a pivoted bracket member that is biased to resiliently hold the tines in adjacency to the cutting blade. The bracket allows the tines upon contact with the ground to spring upwardly over the top of any outspread parts of the plant as the cutting blade severs the root upon being thrust into the ground. As the tool is removed the plant or weed is automatically held between the tines and the blade for easy disposal.

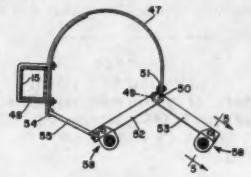
3,608,645
FARM TRAILER WITH LOAD BALANCING MEANS
Elmo R. Meiners, Anchor, Ill.
Filed Dec. 4, 1968, Ser. No. 781,062
Int. Cl. A01b *25/00*
U.S. Cl. 172—491 **16 Claims**



A fertilizer tank mounted on a two-wheeled frame with a tractor hitch includes the improvement of a hydraulically driven linkage for moving the tank forward and rearward on rails incorporated in the frame. The tank is moved on the frame to counterbalance implements that may be attached to the frame.

3,608,646
ROTARY HOE
Edward Clyde Ryan, Ankeny, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Nov. 26, 1968, Ser. No. 778,982
Int. Cl. A01b *33/14*
U.S. Cl. 172—500 **39 Claims**

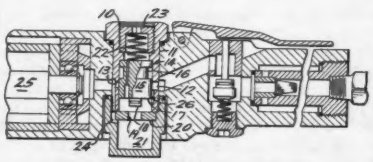
A plurality of transverse sets of front and rear gangs of hoe wheels are individually mounted on a tool bar by leaf springs which will transfer the weight of the tool bar to the gangs to provide down pressure and allow a high degree of flexibility between the sets of front and rear gangs and between the



gangs of a single set so that the gangs can follow the ground contour and have excellent soil penetration.

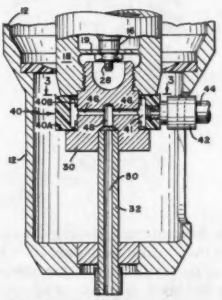
For Class 173—12 see:
Patent No. 3,608,131

3,608,647
PRESSURE-RESPONSIVE FLUID CONTROLLING SYSTEM
John A. Borries, Chesterland, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.
Filed June 18, 1970, Ser. No. 47,196
Int. Cl. B25b *23/14*
U.S. Cl. 173—12 **4 Claims**



A pressure responsive fluid control system for an air tool which is effective to shut off the tool when it reaches a predetermined torque and motor back pressure but will not prematurely react to temporary pressure increases caused by motor inertia. A back pressure sensitive valve has a face exposed to a fluid accumulator chamber whose volume is sufficient to absorb temporary pressure surges but which will increase in pressure to close the valve when the predetermined torque and back pressure are attained.

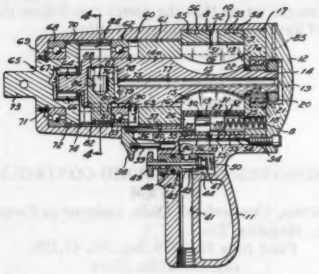
3,608,648
SONICALLY ACTUATED SHAFT WITH COOLANT JACKET
Floyd H. Dibble, Jr., Roxbury, Conn., and Ernest P. Holze, Jr., Brewster, N.Y., assignors to Branson Instruments, Incorporated, Stamford, Conn.
Filed May 25, 1970, Ser. No. 41,127
Int. Cl. B25d *11/00*
U.S. Cl. 173—57 **5 Claims**



A coolant jacket made of low-friction material, such as

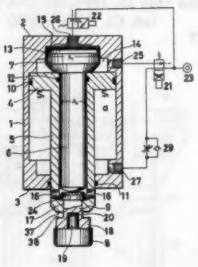
fluorocarbon, surrounds a portion of a shaft which is rotating while undergoing sonic oscillations along its longitudinal axis. The jacket includes flexible rims which move into and out of sealing contact with the shaft responsive to coolant pressure in the chamber formed between the jacket and shaft.

3,608,649
ROTARY IMPACT TOOL
Earl G. Roggenburk, 4120 Behrwald Ave., Cleveland, Ohio
Filed May 5, 1967, Ser. No. 636,528
Int. Cl. B25d *15/00*
U.S. Cl. 173—93.5 **9 Claims**



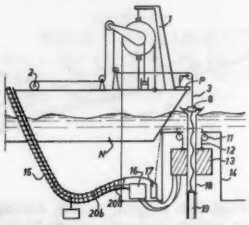
The rotary impact tool has a hammer pin on the rotor which is self-unloading relieving the air pressure in the front end of the tool through a longitudinal exhaust passage in the rotor when the hammer pin is retracted, to prevent such air pressure from retarding the outward movement of the hammer pin in the next rotation of the rotor. A ball bearing in the tool supports the front end of the rotor for rotation and also guides the hammer pin in its movement laterally of the rotor, preventing the hammer pin from turning. This ball bearing is positively positioned by a cylindrical spacer whose opposite end engages another ball bearing which rotatably supports the anvil in the front end of the tool. Antifriction rollers are engaged between the anvil and the front end of the rotor to prevent side thrusts on the anvil from impeding the desired rotation of the rotor.

3,608,650
IMPACT CYLINDER APPARATUS
Saburo Matsusaka, Mukogaokadanchi No. 6-104, No. 9-1, Tsukuno-cho 1-chome, Sakai-shi, Osaka-ku, Japan
Filed Nov. 18, 1969, Ser. No. 877,773
Claims priority, application Japan, Nov. 30, 1968, 43 87810/1968
Int. Cl. B25d *9/00*
U.S. Cl. 173—114 **5 Claims**



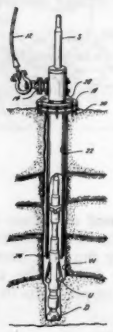
An impulse stamping device having a cylinder in which a hollow piston and piston rod are mounted. The piston rod extends outwardly of the cylinder and has mounted at its end a dieholder. A ram having a head at its upper end is mounted within the hollow rod. The head is adapted to seat within a second cylinder located axially at the upper end of the first cylinder. Compressed gas is fed selectively to the cylinders to operate the piston rod and ram in sequence to first lower the dieholder and thereafter ram the die against the workpiece.

3,608,651
APPARATUS FOR DRIVING ELONGATED ELEMENTS INTO UNDERWATER GROUNDS
Roger Tindy, Bougival, Yvelines, and Andre Castela, Mesnil LeRoi, Yvelines, both of France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil Malmaison (Hauts de Seine), France
Filed June 26, 1969, Ser. No. 836,713
Claims priority, application France, June 27, 1968, PV 156985
Int. Cl. E21b *7/12*
U.S. Cl. 175—6 **4 Claims**



An apparatus for driving elongated elements such as piles, sheet pilings or tubes into the underwater grounds being operated from a central installation and including a device for generating directed periodic impulses, which device is submerged together with the element. The apparatus further includes assembly-supporting means comprised by the impulse-generating device and the element to be driven and being stationary with respect to the water bottom.

3,608,652
UNDERWATER DRILLING APPARATUS
Weldon Medders, and Lawrence Sanford, both of Houston, Tex., assignors to A-Z International Tool Company, Houston, Tex.
Filed Nov. 13, 1968, Ser. No. 775,373
Int. Cl. E21b *15/02*
U.S. Cl. 175—7 **3 Claims**



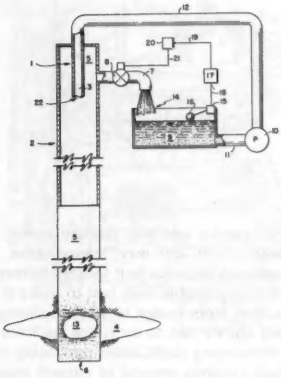
The combination of a drill string, a tubular structure such as an underwater anchor or conductor pipe supported on the drill string for underwater drilling and an antirotational device and the device itself wherein the device has ground engaging elements to grip the bottom of the body of water in which the tubular structure is being set and a connection coacting between the ground-engaging elements and the tu-

bular structure to restrain the tubular structure against rotation during drilling.

3,608,653
METHOD AND APPARATUS FOR CONTROLLING A WELL

William A. Rehm, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 22, 1969, Ser. No. 859,938
Int. Cl. E21b *21/00, 41/00*
U.S. Cl. 175—25 7 Claims

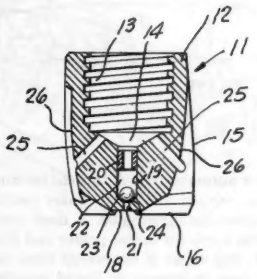


A method and apparatus for controlling a well to prevent a blowout and an accompanying loss of the drilling mud which utilizes the change in volume of the drilling mud in the mud pits. This change in volume is converted to a corresponding pressure change necessary to compensate for the volume change in the relationship of the gas and drilling mud in the well bore to make such compensation as is necessary to maintain the pressure constant at the bottom of the well bore.

3,608,654
ROCK DRILL BIT

Joseph W. Powell, Bishop, Calif., and Juanita Powell, sole heir, Box 18, Placerville, Colo.

Filed Nov. 21, 1969, Ser. No. 878,770
Int. Cl. E21c *13/06*
U.S. Cl. 175—237 6 Claims

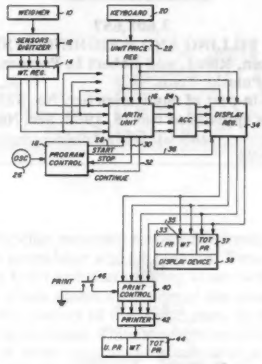


A rock drill bit having helical side cutting edges and radial bottom cutting edges, and having an inside cavity for receiving cooling mud, with diametrically opposite downwardly and outwardly inclined outward passages connecting the inside cavity to diametrically opposite grooves between the side cutting edges. The bottom of the bit has a central mud return passage leading to the inside cavity and provided with a ball check valve.

3,608,655
COMPUTER WEIGHER SYSTEM WITH INTERMEDIATE PRICE CALCULATIONS AND DISPLAY

Robert H. Ray, Cinnaminson, and John M. Holt, Cherry Hill, both of N.Y., assignors to Applied Information Industries

Filed Feb. 20, 1970, Ser. No. 12,998
Int. Cl. G01g *23/38*
U.S. Cl. 177—1 5 Claims

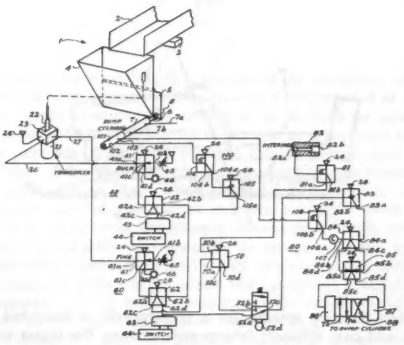


A computer weigher system employs a continuously operating digital computer which multiplies unit price information supplied via a manual keyboard times the weight information supplied via a weigher which incorporates a digitizer for converting the weight information to digital form. From the moment that the article is first placed on the weigher scale until the weigher platform comes to balance, successive intermediate weight measurements are made as the platform moves to balance, and the computer arithmetic unit continuously operates to develop the total price for each such weight measurement. A display device continuously displays the unit price together with the weight measurement as it varies from the zero ;measurement to the final balance measurement, as well as the total price at each measured weight. An operator can determine when the weigher platform has come to balance from the displayed weight, and when the later is unchanged, the operator presses a print button which initiates the operation of a printer to print out the weight and total price as well as the input unit price.

3,608,656
FLUIDIC CONTROL SYSTEM

Charles R. Pettis, Jr., Ithaca, N.Y., assignor to Hi-Speed Checkweigher Co., Inc., Ithaca, N.Y.

Filed Dec. 18, 1968, Ser. No. 784,564
Int. Cl. G01g *19/22*
U.S. Cl. 177—70 9 Claims



A fluidic control for a batch material weigher including a fluidic transducer adapted to produce fluidic control signals

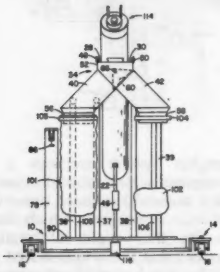
indicative of material induced deflections of a weighing scale, fluidic gates adapted to terminate feeding of the material onto the weighing scale in response to the control signals, and means to adjustably control the response of the gates. Adjustment of the response of the fluidic gates may be servo-controlled by feedback from a net weighing apparatus in order to obtain batches of material at predetermined uniform weights.

3,608,657

BAG FILLING AND WEIGHING SYSTEM

Allie A. Johnson, Rte. 1, and Robert L. Parsons, 202 Thomas St., both of Pulaski, Tenn.

Continuation-in-part of application Ser. No. 525,682, Feb. 7, 1966. This application Nov. 8, 1968, Ser. No. 774,257
Int. Cl. G01g *13/22*
U.S. Cl. 177—93 **4 Claims**



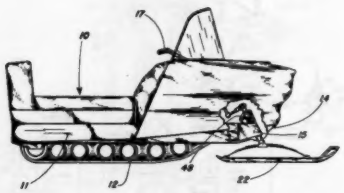
A self-contained weighing and bagging machine which has two bag holding and weighing positions and wherein when one bag is filled to the prescribed weight the machine automatically stops filling that bag and commences to fill the other bag permitting the filled bag to be removed and be replaced with an empty bag.

3,608,658

STEERING MECHANISM FOR SNOWMOBILE

William L. Woodfill, Oshkosh, and James R. Meininger, Fond Du Lac, both of Wis., assignors to Brunswick Corporation, Chicago, Ill.

Filed Apr. 30, 1970, Ser. No. 33,339
Int. Cl. B62m *27/02*
U.S. Cl. 180—5 R **2 Claims**



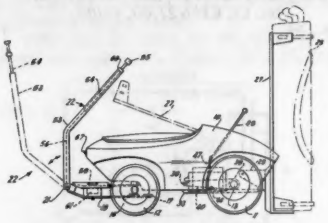
Each steering spindle for a snowmobile is mounted with cam and cam follower interposed between the upper end of the spindle and the snowmobile frame. The cams are arranged to extend the outside ski and withdraw the inside ski when turning to force the snowmobile to lean into a corner with corresponding improved steering response.

3,608,659

MOTORIZED GOLF CART

Norman S. Gardner, 64 Trenor Drive, New Rochelle, N.Y.

Filed Apr. 7, 1969, Ser. No. 813,922
Int. Cl. B62d *51/04*
U.S. Cl. 180—19 H **10 Claims**



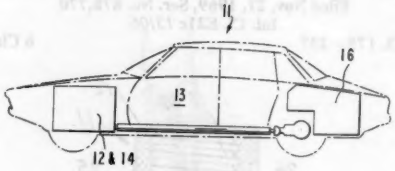
Wheeled cart carries one-way electric motor, battery for energizing motor, and one-way transmission for driving wheels. Transmission includes belt loosely trained about pulleys, and a roller engageable with belt to make it taut so that it transmits motion from motor to wheels; disengagement of roller from belt allows cart to be rolled backwardly. Handle includes two telescoping parts, inner part being connected to a rheostat which controls amount of current supplied to motor. Pulling force on outer end of handle determines setting of rheostat and speed of motor.

3,608,660

SMOG-FREE AUTOMOBILE AND METHOD OF OPERATING SAME

Richard D. Smith, Palo Alto, and Dale A. Furlong, Menlo Park, both of Calif., assignors to Combustion Power Company, Inc., Palo Alto, Calif.

Filed Feb. 3, 1969, Ser. No. 796,089
Int. Cl. B60k *15/08*
U.S. Cl. 180—54 B **9 Claims**



A smog-free automobile is described burning fuel and substantially pure oxygen and spray water cooling the cylinder walls and pistons during exhaust. A dual combustion system is utilized, Otto cycle for cruise power and diesel cycle above cruise power, and water is recovered from the exhaust. The fuel can be pure hydrogen or liquid gasoline. With liquid gasoline, oxygen input atomizes the gasoline and with hydrogen fuel both hydrogen and oxygen can be produced by electrolysis, ideally utilizing nuclear electric generation for a complete smog-free system operation. Gaseous material is stored in a plurality of high-pressure vessels and in the case of hydrogen fuel with the pressure vessels at the rear of the auto. Separate sets of vessels are provided for cruise power supply and above cruise power supply and valving is provided to use the opposite set of tanks in case fuel for one operation is exhausted.

3,608,661

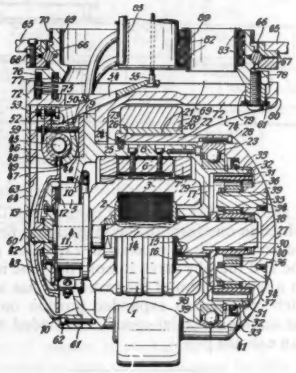
MOTORIZED WHEEL TRACTION DRIVE UNITS

Alfred R. E. Arnot, The Bell House, Baughurst, Basingstoke, Hampshire, England

Continuation-in-part of application Ser. No. 448,011, Apr., 1965, now abandoned. This application July 8, 1968, Ser. No. 747,048

Int. Cl. B60k 7/00

U.S. Cl. 180—65 F 11 Claims



A compact motorized wheel has a motor cantilevered on a support and carrying a hub and tire. A gyratory epicyclic gear couples the motor shaft to the hub.

3,608,662

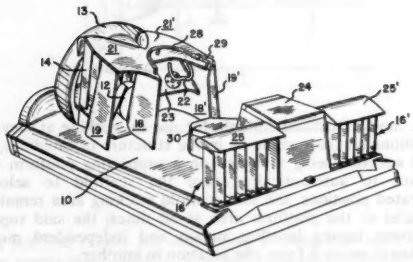
AIR CUSHION VEHICLE

Hugo S. Ferguson, Averill Park, N.Y., assignor to Air Cushion Vehicles, Inc., Poestenkill, N.Y.

Filed Jan. 14, 1970, Ser. No. 2,810

Int. Cl. B60v 1/16, 1/18

U.S. Cl. 180—117 22 Claims



A single propeller mounted toward the front of the vehicle provides both propulsion and air cushion. Two-point steering is provided by front and rear steering vanes with air channels on each side which direct a portion of the downstream flow of air, under the control of the front vanes, to the rear vanes. The air channels shield the operator from the propeller airblast, and produce air curtains on either side of the operator to shield him from spray and dust. Joint steering of front and rear vanes is provided, with means for changing the relative vane angles to counter crosswinds and side slope on hills.

3,608,663

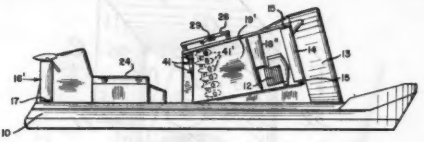
AIR CUSHION VEHICLE WITH THRUST CONTROL

Hugo S. Ferguson, Averill Park, N.Y., assignor to Air Cushion Vehicles, Inc., Poestenkill, N.Y.

Continuation-in-part of application Ser. No. 2,810, Jan. 14, 1970. This application Apr. 20, 1970, Ser. No. 30,158

Int. Cl. B60v 1/14

U.S. Cl. 180—120 16 Claims



A single propeller mounted toward the front of the vehicle provides both propulsion and air cushion. Two-point steering is provided by front and rear steering vanes with air channels on each side which direct a portion of the downstream flow of air, under the control of the front vanes, to the rear vanes. To reduce forward thrust while maintaining effective steering control, sets of vanes are rotatably mounted in the air channels and controllable to block passage of air therethrough.

3,608,664

CUSHION BARRIERS FOR AIR CUSHION VEHICLES

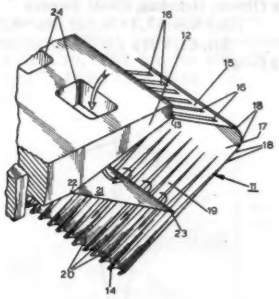
Norman Ralph Taylor, Cowes, Isle of Wight, England, assignor to British Hovencraft Corporation, Limited, Yeovil, Somerset, England

Filed May 2, 1969, Ser. No. 821,266

Claims priority, application Great Britain, May 8, 1968, 21,689/68

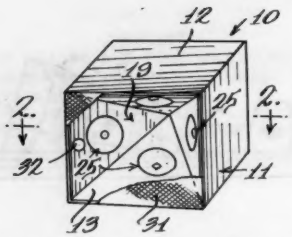
Int. Cl. B60v 1/16

U.S. Cl. 180—127 2 Claims



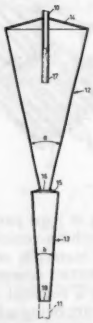
A barrier for bounding at least part of the periphery of the cushion area of an air cushion vehicle is constructed at least in part from composite materials so as to have an acutely bent cross section. The barrier comprises an upper part and a lower part connected by a resilient sharply curved part, the free edge of the upper part being adapted for attachment to the rigid structure of the vehicle. In its nonoperational state, the upper part of the barrier extends outwardly from the vehicle to merge with the sharply curved part, which curves sharply downwardly and inwardly to merge with the lower portion which extends inwardly with respect to the vehicle, terminating in a free edge. When the cushion is pressurized, the pressure on the barrier overcomes the resilience of the sharply curved part and moves the free edge of the lower part downwardly and outwardly in opposition to the normal sharply curved configuration of the resilient part. The resilience of the sharply curved part is sufficient to return the barrier to its original configuration when the cushion pressure ceases.

3,608,665
SOUND-REPRODUCING STRUCTURE
Mohamed B. A. Drisi, 100 W. Main St., Glenwood, Ill.
Filed Sept. 16, 1969, Ser. No. 858,484
Int. Cl. G10k *13/00*; H04r *1/28*
U.S. Cl. 181—31 B 8 Claims



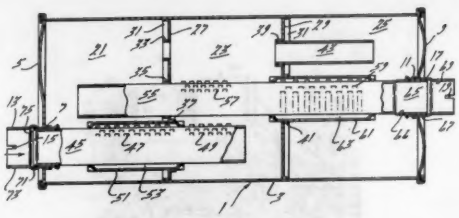
A sound-reproducing structure wherein one or more loudspeakers are mounted on baffle means within a baffle housing to direct the sound (a) from the speaker, directly, forwardly outwardly through the forward opening of the cabinet; (b) against a reflecting surface within the cabinet and hence forwardly outwardly through the forward opening of the cabinet; (c) inwardly against the apex of the baffle means and hence forwardly outwardly through the forward opening of the cabinet. From the back of the cabinet, as a reverse phase, the sound follows a similar reflecting and retarding process but aimed toward the rear of the cabinet. The sound-reproducing structure effectively defines a phase division horn means wherein a portion of the total sound emanating forwardly and rearwardly from the cabinet is delayed in time before passing outwardly therefrom.

3,608,666
SILENCER
Karl Borje Olsson, Hellekas, Kivik, Sweden
Filed Nov. 17, 1970, Ser. No. 90,296
Int. Cl. F01n *1/02*, *1/08*, *7/02*
U.S. Cl. 181—47 4 Claims



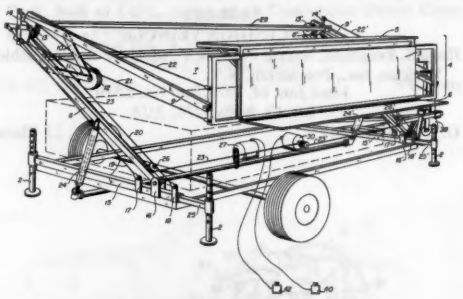
Silencer or muffler for a combustion apparatus such as an internal combustion engine or gas or oil burner, comprising two coaxial truncated cones of different widths at their wide ends, which are provided with end walls and central openings therein, the wide cone having its small end connected to the opening in the end wall of the narrow cone, and the cone angle of the two cones being in different ranges, preferably about 25° for the wide cone and preferably about 10° for the narrow cone.

3,608,667
MUFFLER TUBE AND BUSHING CONNECTION
John H. Foster, Clarke Lake, Jackson, Mich., assignor to Tenneco Inc., Houston, Tex.
Filed May 9, 1969, Ser. No. 823,329
Int. Cl. F01n *7/18*
U.S. Cl. 181—61 3 Claims



The inlet and/or outlet end of an exhaust muffler contains a bushing which in one form of the invention is provided with an expanded annular rib to receive an expanded portion of a gas flow tube and thereby serve to hold the tube in axial position; and, in a second form of the invention, has an expanded portion which receives an expanded portion on a gas flow tube so that additional axial space is provided to receive a tailpipe or an exhaust pipe.

3,608,668
MOBILE SCAFFOLD
James B. Mahaney, 401 E. Downing St., Tahlequah, Okla.
Filed July 16, 1970, Ser. No. 55,374
Int. Cl. B66f *11/04*
U.S. Cl. 182—2 6 Claims

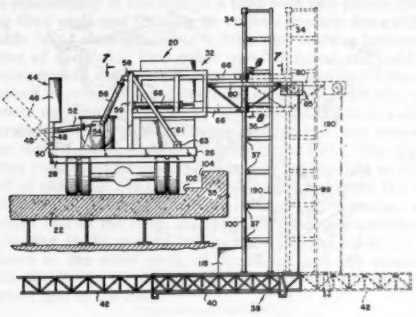


A mobile scaffold suitable for use in working at elevated positions on the outside or inside structure of buildings, the said scaffold being mounted on a supporting platform with means to automatically move the scaffold to selected elevated positions, the said scaffold working area remaining parallel to the platform area at all times; the said support platform having levelling means and independent motion means to move it from one location to another.

3,608,669
BRIDGE-PAINTING APPARATUS AND METHOD
Lewis L. Lindsay, Jr., Richmond, Va., assignor to Bridge Painting, Inc., Richmond, Va.
Filed Dec. 2, 1969, Ser. No. 881,426
Int. Cl. E04g *1/24*, *1/36*
U.S. Cl. 182—14 28 Claims

A bridge-painting apparatus employing an extensible scaffold means and method of folding the latter whereby the apparatus may be transported by a motor vehicle. The apparatus includes a mast or boom with means for extending

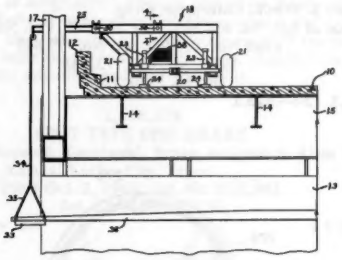
the boom over the side of a bridge to be painted and means for raising and lowering it. The boom is provided with a reinforcing frame construction to which the extensible scaffold means is secured. A split collar construction permits the boom to be raised and lowered without dismantling any of the apparatus whereby the apparatus may be ready for operation and/or removal in an extremely short period of time. A remote control means is provided whereby the apparatus may be extended or collapsed with great facility. The vehicle on which the apparatus is mounted is provided with abutment or curb-sensing means whereby the vehicle may be driven remotely and automatically.



3,608,670
SCAFFOLD TENDER

James H. Blake, 1520 E. Capital Expressway #220, San Jose, Calif., and Richard E. Barber, 6800 Enterprise Road, Box 25, Ferndale, Wash.

Filed Apr. 13, 1970, Ser. No. 27,867
Int. Cl. E04g *3/10*
U.S. Cl. 182—63 **8 Claims**

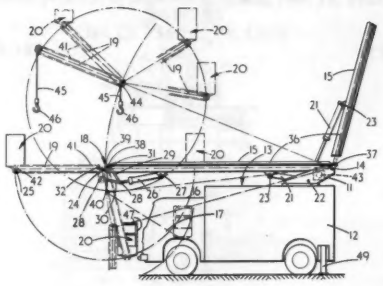


A scaffold tender for suspending a transverse work platform across the underside of highway bridges or the like. The scaffold tender comprises a wheeled framework supported on the bridge deck. A plurality of longitudinally spaced supports are mounted at each side of the framework, each support being selectively retractable in order to clear vertical abutments during movement of the framework along the bridge. The work platform is alternately suspended from one or more of the extended supports during movement of the scaffold tender. The method of traversing the bridge involves the alternate use of the supports and the movement of each support between a retracted position and an extended position as required to clear obstructions encountered in the path of movement of the framework.

3,608,671
MOBILE MACHINE WITH AN ELEVATABLE AND TRAVELLING CARRIER

Denis Henry Ashworth, Woodsetton, near Dudley, England, assignor to Simon Engineering Dudley Limited, Dudley, England

Filed Feb. 20, 1969, Ser. No. 800,855
Claims priority, application Great Britain, Feb. 23, 1968, 8823/68
Int. Cl. B66f *11/04*
U.S. Cl. 182—141 **10 Claims**

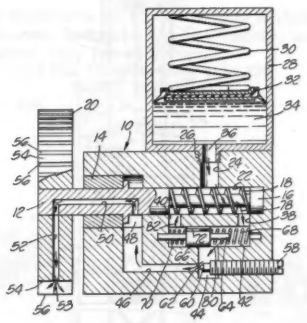


A mobile machine of the kind having an elevatable and travelling load-supporting carrier comprising, a supporting base structure rotatable about a vertical axis, an articulated structure of pivotally interconnected booms having horizontal pivots and including a main boom and at least one auxiliary boom which main boom is pivotally supported by a horizontal pivot member mounted to a part of the supporting base structure and which one auxiliary boom or the auxiliary boom furthermost from the main boom is pivotally connected at its end remote from the boom interconnecting pivot to the load-supporting carrier.

3,608,672
AUTOMATIC GEAR LUBRICATOR

Gerard W. Dandridge, 4857 W. 147th St., Hawthorne, Calif.

Filed Mar. 10, 1969, Ser. No. 805,445
Int. Cl. F01m *1/00;* **F16n** *7/36*
U.S. Cl. 184—6 TT **4 Claims**



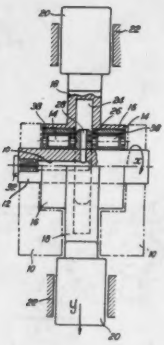
A device for continuously supplying small quantities of grease to a gear or train of gears. The unit consists of an idler gear to which is coupled a screwshaft mounted in a body which is suitably drilled and channeled and to which is connected a spring-loaded grease cartridge. The screwshaft takes grease supplied from the cartridge and conducts a metered amount through the channels to the idler gear where it is expelled between the gear teeth to lubricate gears with which it is in mesh.

3,608,673

LUBRICATION DEVICE FOR UNBALANCED ROTATING MEMBERS, PARTICULARLY PERCUSSION TOOLS

Pietro Cucciati, Via Velasca 8, Milan, Italy

Filed Oct. 27, 1969, Ser. No. 869,666
Claims priority, application Italy, May 14, 1969, 16,879-A/69
Int. Cl. E02d 7/18; F16n 1/00
U.S. Cl. 184—6.14 6 Claims



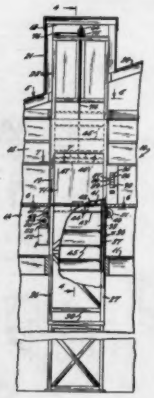
A housing having an annular chamber defined at its radially inner side by an annular ring. Lubricant is conveyed into said chamber under the influence of dynamic action, through an opening in the ring, to lubricate bearings adjacent the ring and supporting the housing on a shaft extending through the ring. The opening in the ring communicates with a passageway in the shaft.

3,608,674

STORAGE ELEVATOR HAVING MULTIPLE SHELVES

Walter A. Phillips, P.O. Box 3237, Fort Smith, Ark.

Filed May 20, 1969, Ser. No. 826,108
Int. Cl. B66b 9/00
U.S. Cl. 187—3 4 Claims



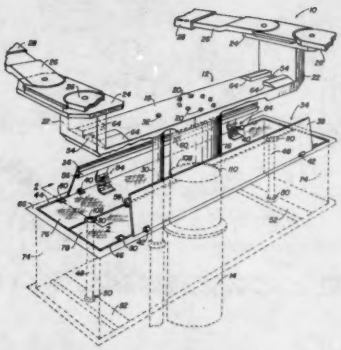
Apparatus located in an elevator shaft within a building and including an elevator having multiple storage areas and means for selectively moving the areas to an opening in the wall normally closed by a door. The apparatus includes a reversible motor for moving the elevator in the desired direction when a pushbutton switch is closed.

3,608,675

VEHICLE LIFT INSTALLATION

Martin J. Sherry, Dayton, Ohio, assignor to The Joyce-Cridland Company, Dayton, Ohio

Filed July 30, 1969, Ser. No. 846,009
Int. Cl. B66f 7/00
U.S. Cl. 187—8.62 27 Claims



Open areas of the floor pit of a vehicle lift installation are covered by a first pair of cover plates when the lift is lowered and by a second pair of cover plates when the lift is raised. The first pair of cover plates are spread open by the lift superstructure or jacking unit and the second pair of cover plates are moved to a closed position by motion transmitting means connecting them to the first pair of cover plates.

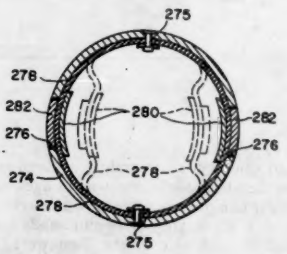
In one embodiment the motion transmitting means interconnecting the two pairs of cover plates includes a lost motion linkage and the pivot axes for the two pairs of cover plates are offset whereby the second pair of cover plates pivots through a greater angle than the first pair of cover plates. In the second embodiment the plates forming the two pairs of cover plates are interconnected by combined hinge and motion transmitting devices and both pairs of cover plates are pivoted through substantially 90°.

3,608,676

REVERSIBLE IRRIGATION LINES

Gregory J. Wieck, Enterprise, Oreg.

Division of Ser. No. 654,809, July 20, 1967, Pat. No. 3,447,751.
Filed Nov. 6, 1968, Ser. No. 773,845
1968, Ser. No. 773,845
Int. Cl. F16k 15/14
U.S. Cl. 137—525.1 5 Claims



A long hose having sprinklers at both ends forms, with a cable running over a reversible, powered capstan, an endless, reversible towline. The length of the hose is about one-half of the length of the area to be irrigated and the hose is advanced through an injection tube at the central portion of the area to be irrigated, and water under pressure supplied to the tube enters the hose through check valves in thick-walled coupling portions spaced along the hose. The check valves

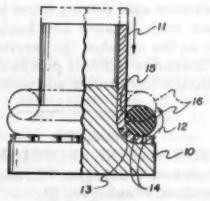
are in the form of elastic sleeves fitting in the coupling portions, each sleeve normally covering two oppositely disposed openings in the coupling portion and adapted to buckle from the higher water pressure in the injection tube to admit water into the hose. Each sleeve preferably has stiff backing plates on its inside and plugs on its outside filling the openings in the coupling portion. The openings preferably are elliptical. Washing chambers at the ends of the injection tubes wash the hose before it enters the seals in the injection tubes. In one construction, two hoses with sprinklers are disposed in parallel relationship in one side of a field with two cables connecting their ends and forming an endless towline therewith, one cable being on a capstan of a drive unit midway between two sides of the field. Two other parallel hoses and cables are positioned in the other half of the field and are pulled by a second capstan of the drive unit. In another construction, a power unit midway between two sides of the field pulls two parallel cables to pull two hoses through injection tubes from one side of the field to the center of the field. The injection tubes then are disconnected from a fixed pipeline in the first half of the field, the cables are disconnected from the hoses, the hoses and injection tubes are towed by a tractor to the second half of the field, the injection tubes are connected to a pipeline in the second half of the field, the cables are connected to the other ends of the hoses, and the power unit pulls the hoses to the power unit from the far side of the second half of the field.

3,608,677

FRAGMENTING TUBE ENERGY ABSORBER

Donald H. Wykes, Downey, Calif., assignor to North American Rockwell Corporation, El Segundo, Calif.

Filed Oct. 3, 1968, Ser. No. 764,892
Int. Cl. F16f 7/12
U.S. Cl. 188—1 **15 Claims**



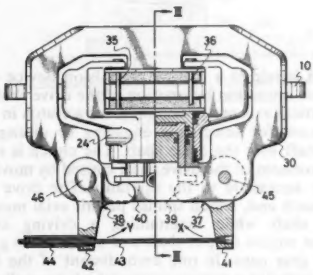
A frangible tube energy absorber is described including means for inhibiting propagation of longitudinal fracture of the tube. In a preferred embodiment the means for inhibiting propagation of longitudinal fracture comprises means for applying a radially inwardly directed force against the outside of the tube also inducing a higher frequency of transverse cracking to increase the amount of energy absorbed as well as improve the reliability and reproducibility.

3,608,678

SPOT-TYPE DISC BRAKE

Toyoaki Kobayashi, Toyohashi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

Filed Oct. 2, 1969, Ser. No. 863,302
Int. Cl. F16d 55/228
U.S. Cl. 188—72.6 **6 Claims**



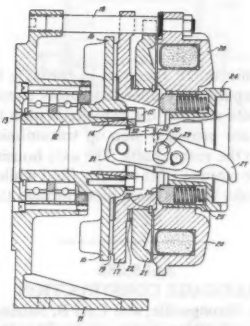
A spot-type disc brake having a dual circuit from a master cylinder wherein four pistons are provided in a single hydraulic cylinder located on a stationary member so as to constitute two independent hydraulic chambers to which pressurized fluid is applied through each fluid passage for braking, and one of the pistons is adapted to be actuated mechanically by a hand-lever for parking.

3,608,679

ELECTRICALLY OPERATED BRAKING DEVICE

Stanley George Harrison, Leederville, Western Australia, Australia, assignor to Westate Electrical Industries Limited, Leederville, Western Australia, Australia

Filed July 7, 1969, Ser. No. 839,255
Claims priority, application Australia, Nov. 18, 1968, 46397/68
Int. Cl. F16d 65/24, 55/22
U.S. Cl. 188—171 **7 Claims**



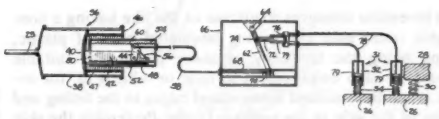
A braking device for a machine having a rotating shaft wherein a brake disc is attached to the shaft for rotation therewith, the brake disc facing a brake plate which plate is held away from the brake disc by an electromagnet, manually operable locking means being provided to lock the brake plate in a released position when the electromagnet is deenergized, the locking means being automatically disengaged when the electromagnet is energized.

3,608,680

LOAD-RESPONSIVE BRAKING MECHANISM

Robert G. Beacon, Rosemere, Quebec, Canada, assignor to Ellcon National, Inc., Totowa Borough

Filed Feb. 13, 1970, Ser. No. 11,230
Int. Cl. B60t 8/22
U.S. Cl. 188—195 **9 Claims**



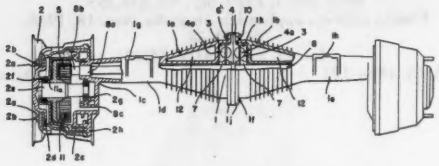
A braking mechanism for a railway car including feeler apparatus mounted on each side of a railway car truck for indicating movement of the bolster with respect to the truck side frames, load-compensating apparatus connected to the brake cylinder pipe for varying pressure of air in the brake cylinder, and equalizer apparatus for receiving vertical movement indications from the feeler apparatus and sending corresponding indications to the load-compensating apparatus.

3,608,681

HYDRODYNAMIC BRAKE

Karl Schlor, Biebesheim (Rhine), Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Germany

Filed Feb. 24, 1969, Ser. No. 826,037
Claims priority, application Germany, Feb. 23, 1968, P 16 55 479.3
Int. Cl. F16d 57/06
U.S. Cl. 188—274 4 Claims



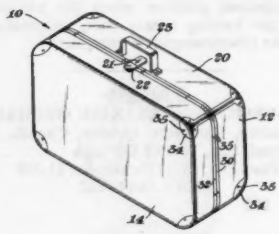
A hydrodynamic brake received in the axle housing of a vehicle with independently operable rotors connected to the wheels on opposite sides of the vehicle. Within the wheel assemblies, there are provided step-up transmissions connecting the wheels to the rotor shafts. The axle housing includes a compartment for storage of the brake fluid while the thermal energy of the brake fluid is dissipated through the wall of the housing.

3,608,682

LUGGAGE CONSTRUCTION

John R. Newton, Strongsville, and Carl B. Salzinger, Mayfield Heights, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1967, Ser. No. 664,134
Int. Cl. A45c 5/02; B32b 27/32
U.S. Cl. 190—53 12 Claims



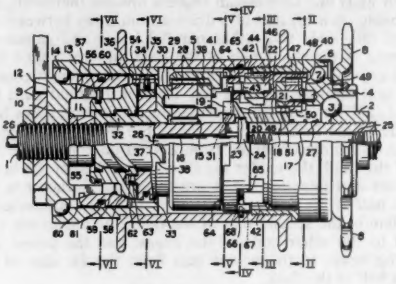
This invention concerns a suitcase or the like having a non-blushable outer skin comprising laminated plies of plastic, blushing being the tendency of many plastics of suitable thickness for skin employment to fade or whiten as, for example, when bent around corners and edges in the fitting and securing of the skin to the suitcase frame. Preferably the skin is of a three-ply construction with each ply being in its naturally transparent or translucent nonpigmented state. A pigmented, opaque adhesive blended to provide the desired skin color secures the two outermost plies. The outer ply is formed sufficiently thin to endure the bending or forming required, such as at the corners of the suitcase, without the occurrence of a blush mark thereat. Thus, the combination of the opaque adhesive and thin outer ply effectively conceals and prevents blush marks from appearing on the visible outer surfaces of the skin.

3,608,683

BICYCLE HUB HAVING A BUILT-IN THREE-STAGE SPEED CHANGE MECHANISM AND EQUIPPED WITH A COASTER BRAKE

Kentaro Fujisawa, Sakai, Japan, assignor to Shimano Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 22, 1969, Ser. No. 852,239
Claims priority, application Japan, Sept. 18, 1968, 43/67783
Int. Cl. F16h 57/10
U.S. Cl. 192—6 A 5 Claims



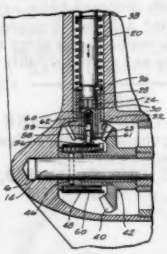
This invention relates to a bicycle hub having a built-in three-stage speed change mechanism, wherein rotation of a driving drum is imparted through separate pawl and ratchet means to an annulus or driven member and to a planet carrier supporting a plurality of planet pinions, and the pawl and ratchet means between said driving drum and said annulus is adapted to impart both forward and backward rotations of the driving drum to the annulus, the mechanism being so improved that the invention exhibits practical effects such as a simple construction, a less trouble and so on.

3,608,684

CLUTCH FOR MARINE PROPULSION DEVICE

William J. Shimanckas, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Oct. 29, 1969, Ser. No. 872,142
Int. Cl. F16d 11/04, 41/20; B63h 21/28
U.S. Cl. 192—20 8 Claims



Disclosed herein is a marine propulsion device which affords reverse operation by rotation of the drive shaft housing about a vertical axis and which includes a clutch in the lower unit gear case for selectively engaging or disengaging the propeller shaft with the drive shaft. The clutch is responsive to axial movement of the drive shaft caused by moving a control handle accessible to the operator. The drive shaft has splines at each end, which splines permit axial movement of the drive shaft while maintaining a driving connection between the engine output shaft and a first bevel gear in the lower unit gear case. In one embodiment of the invention, the clutch includes a torsion spring which normally grips the hub of a second bevel gear rotatably carried by the propeller shaft to secure the gear to the propeller shaft. Downward

axial movement of the drive shaft interferes with rotary movement of the spring with the propeller shaft and thus unwinds the spring to release the grip of the spring on the bevel gear hub to disconnect the second gear from the propeller shaft. In another embodiment, downward movement of the drive shaft causes an axial projection on the lower end of the drive shaft to engage an axially inclined cam surface located on a clutch dog which is splined to the propeller shaft to shift the clutch dog axially and disengage the clutch dog from the bevel gear on the propeller shaft and interrupt transfer of power from the gears to the propeller shaft.

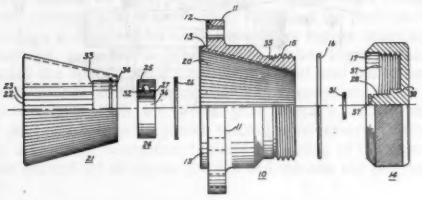
ERRATUM

For Class 192—24 see:
Patent No. 3,608,691

3,608,685
SELECTIVE DRIVE HUB CLUTCH

Glenn W. Childress, 1480 Sumac Ave., Boulder, Colo.

Filed Dec. 2, 1969, Ser. No. 881,496
Int. Cl. F16d *15/00, 17/00, 23/04*
U.S. Cl. 192—94 6 Claims

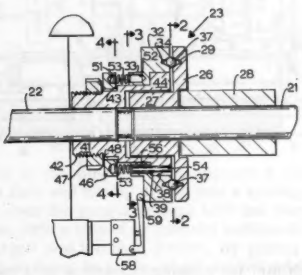


A selective drive clutch for the front wheels of four-wheel drive vehicles comprises inner and outer clutch members having frustoconical interengageable toothed surfaces which are moved into and out of engagement by a closure cap threaded on the outer member, the outer member being securely attached as a hub on the wheel to be driven. A ball bearing assembly or the like mounted on the inner member constitutes an end bearing for the vehicle drive axle when the clutch is disengaged. The entire assembly is locked together by two snap rings one retaining the bearing in the inner member and the other locking the closure cap to the bearing assembly.

3,608,686
AUTOMATIC RELEASE CLUTCH

Thomas B. Martin, Sr., 182 Cross Road, Danville, Calif., and Thomas B. Martin, Jr., 17 Dudley Court, Pleasant Hill, Calif.

Filed Dec. 18, 1969, Ser. No. 886,160
Int. Cl. F16d *43/20, 7/00*
U.S. Cl. 192—150 7 Claims

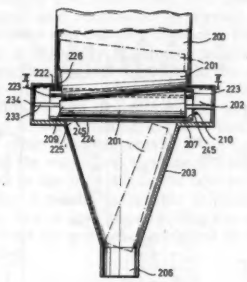


To prevent damage to automatic machine tools wherein a motor is connected to a rotating machine tool part a clutch is interposed which opens by axial movement when the load of springs is exceeded. Axial movement of a clutch element causes a switch to open, thereby deenergizing the motor. The clutch drive comprises two facing disks having holes to receive resilient balls which normally function as keys. When the clutch is overloaded, the disks move apart, permitting the bills to leave the holes and ride in grooves in the disk faces.

3,608,687
APPARATUS FOR ORIENTING TAPERED BOBBINS

Gunter Schulz, Ebersbach, and Gerhard Haussmann, Ebersbach-Sulpach, both of Germany, assignors to Zinser-Textilmaschinen Gesellschaft mit beschrankter Haftung, Ebersbach, Germany

Filed June 12, 1970, Ser. No. 45,671
Claims priority, application Germany, June 12, 1969, P 19 29 866.9
Int. Cl. B65g *11/20*
U.S. Cl. 193—43 B 9 Claims

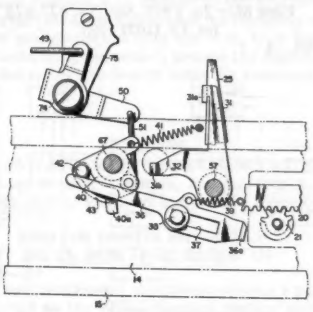


Random-oriented conical bobbins, having a wide end and a narrow end are, one-by-one, positioned over the opening of a discharge chute. A pusher, when moved transversally towards a positioned bobbin, gradually displaces the latter axially in the direction of its narrow end, so that the bobbin falls into said chute wide end first. The displacement of each bobbin is effected by that one of two working edges forming part of said pusher and disposed obliquely with respect to the bobbin length which is adjacent said wide end.

3,608,688
A PARAGRAPH INDENTATION MECHANISM FOR TYPEWRITERS

Yukio Hishida, and Toshio Nakai, both of Nagoya, Japan, assignors to Brother Industries Ltd., Nagoya, Japan

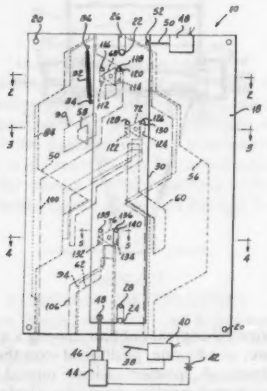
Filed Nov. 25, 1968, Ser. No. 778,489
Claims priority, application Japan, Nov. 25, 1967, 75832/67
Int. Cl. B41j *19/00*
U.S. Cl. 197—82 11 Claims



A paragraph indentation mechanism for a typewriter which has an escapement mechanism for controlling the letter-spac-

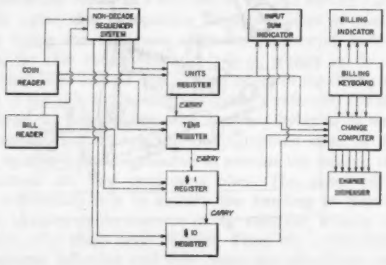
ing movement of the carriage and which includes a rack mounted on the carriage and also a member pawl mounted on a frame for both pivotal and limited sliding movement in a carriage traveling direction. A special key is operatively connected to the member pawl and the escapement mechanism for engaging the member pawl with the rack and then disabling the escapement mechanism so as to move the carriage with the member pawl. By this mechanism, the carriage is moved in a letter-spacing direction a number of spaces, for example five, from any position where the carriage is retained by the escapement mechanism.

3,608,689
BINARY COIN TOTALIZER
William Rosenhagen, Ossining, N.Y., assignor to Rowe International, Inc., Whippany, N.J.
Filed Sept. 22, 1969, Ser. No. 859,902
Int. Cl. G07f *1/00*
U.S. Cl. 194—1 **14 Claims**



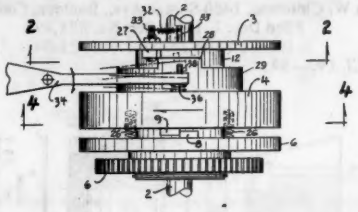
A binary coin totalizer in which a plurality of guide plates are mounted in side-by-side relationship to form branched paths for coins of different denominations. Coin diverters selectively common to branches of the various paths alternatively divert successive coins passing thereby to different branches ultimately to direct all coins saving the last making up the total for which the device is set to a first opening and to direct the last coin out of a second opening to indicate that the total has been deposited in the totalizer.

3,608,690
APPARATUS AND METHODS FOR REGISTERING CASH, REGISTERING A SALE, AND AUTOMATICALLY DISPENSING CHANGE
Robert D. Morrow, Baltimore, and Donald E. Miller, Glen Burnie, both of Md., assignors to Technology Systems Incorporated, Cockeysville, Md.
Filed May 26, 1969, Ser. No. 827,675
Int. Cl. G07f *1/06*
U.S. Cl. 194—4 **43 Claims**



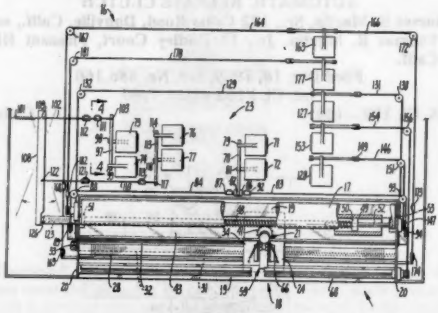
Robbery-immune cash-handling system in which bills and coins are received, identified, and registered, the amount of a sale is registered and correct change is automatically computed and disbursed. Multicell magazines are provided for $10, $5, and $1 bills, which are dispensed automatically as change. $1 bills are also loaded automatically. Step switches are employed in a parallel addition technique for registering cash inputs and in a dynamic subtraction technique for computing and dispensing change. Cash reserves are accessible only to authorized personnel.

3,608,691
OVERLOAD CLUTCH
Harold J. Rosenberg, 1408 Patuxent Drive, Ashton, Md.
Filed Sept. 23, 1969, Ser. No. 860,379
Int. Cl. F16d *11/04, 43/20*
U.S. Cl. 192—24 **2 Claims**



An improved overload and synchronizing clutch of the type shown in U.S. Pat. No. 3,103,999 obviates a problem of clutch sticking and wear, permits the clutch to be set up for either right-hand or left-hand drive without removing any major parts, and permits rapid change in operating torque range to be made.

3,608,692
SELECTOR STRUCTURE FOR PRINTING MACHINE
Donald J. Henry, 1454 California St., San Francisco, Calif.
Filed Nov. 22, 1968, Ser. No. 778,183
Int. Cl. B41j *1/26*
U.S. Cl. 197—55 **19 Claims**



A teleprinter for printing characters on a receiving medium in response to a telegraphic code, including a platen, a carriage movable along the platen, a cylindrical type element mounted on the carriage and bearing the print characters embossed thereon in circumferential rows, a worm gear mounted for both rotation and axial motion and a lockable pinion gear meshed with the worm gear so that the combina-

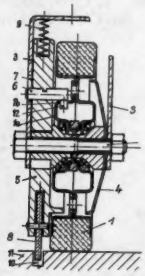
tion of the two acts both as a rack and pinion and as a lead screw and follower for rotatably and transversely positioning the type element to select a print character, and a selector mechanism for operating the type positioning means in response to the signals for a decoding and conversion circuit which processes the incoming telegraphic code signal. The type element is mounted on a shaft which is splined through the center of the pinion gear to rotate with the slide axially through the pinion gear. The end of the shaft opposite the type element slides laterally along a vertically movable track. The selector mechanism uses solenoids coupled in combinations to levers which gang the actions of the solenoids to create the motions of the worm gear and the transversely movable track. The type element is struck to print the character by a trigger mechanism cocked and released by an elongated spline, the spline being rotated by a ratchet driven by a solenoid. The decoding and conversion circuit includes a clock for generating time codes which in turn gate a serial to parallel converter. A first set of memory units stores the parallel signal until it is examined to detect nonprinting function characters, and the signal is then gated to a second set of memory units for retention of those portions of the signal which are unchanged from one character to the next, to minimize motion of the type element. A logic circuit recognizes the carriage return instruction, examines the position of the carriage and spaces forward if necessary before returning the carriage, to preserve synchronism. Other logic circuits recognize the spacing, line feed, figures shift and the letters shift instructions and operate solenoids appropriate to lock the pinion gear, shift the worm gear laterally, rotate the worm gear or advance the platen ratchet as necessary. Detection of a function instruction inhibits the gating of the signal into the second set of memory units and inhibits the printing action.

3,608,693

ROLLERS, PARTICULARLY FOR SHOPPING TROLLEYS

Herbert Stosberg; Horst Fleishmann; Gunter Reinhards, and Engel Siegfried, all of Wermelskirchen-Tente/Rhineland, Germany, assignors to Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Companie, Wermelskirchen-Tente am Rhineland, Germany

Filed Apr. 10, 1969, Ser. No. 814,961
Claims priority, application Germany, Sept. 18, 1968, G 67 51 035
Int. Cl. B60b *33/00*
U.S. Cl. 198—16 **14 Claims**



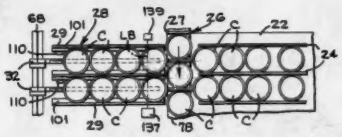
A roller for a shopping trolley comprises a wheel held rotatably in a fork and having at one side a sensing member which travels over the ground surface with the wheel. When the wheel runs onto a ribbed or grooved surface the sensing member is urged down into a groove, by gravity or by a spring, and in so doing locks the wheel against rotation. The locking of the wheel may be effected by a lug which either enters an aperture in a hub rim of the wheel or engages teeth on the hub. In an alternative the wheel is formed by two wheel discs with a sensing disc situated between them. The sensing disc has a locking cam which can engage a bore in a nonrotatable bearing sleeve of the wheel discs.

3,608,694

CASING MACHINE

David F. Schlueter, Hoopeston, Ver milion, Ill., and Myron C. Noble, South Bend, St. Joseph, Ind., assignors to FMC Corporation, San Jose, Calif.

Filed Sept. 6, 1968, Ser. No. 757,876
Int. Cl. B65g *47/42*
U.S. Cl. 198—21 **5 Claims**



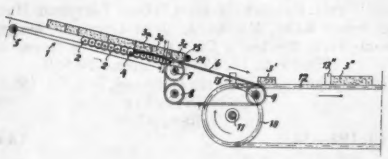
Upright containers are fed into the casing machine from a multiple-lane supply line, assembled into one tier, and the tier is transferred and reoriented by tiering fingers which deposit the containers in a tiering chamber. The open end of an empty case is manually positioned adjacent the tiering chamber, and pusher feet insert the tier in the case. A feature of the casing machine is a rocking differential which smoothly accelerates and decelerates the tiering fingers to prevent damage to the containers. Other features include a timing pin and chain mechanism which can be manually adjusted to control the number of tiers loaded into a case, rapid change structure in the zone where the tiers are assembled so that the machine is readily adaptable to handle a range of container sizes, and a lowerator mechanism under positive mechanical control for gently lowering the loaded cases to a discharge position.

3,608,695

FEED RATE EQUALIZER MEANS

Nils Erik Hellstrom, Nyland, Sweden, assignor to Aktiebolaget Hammars Mekaniska Verkstad, Nyland, Sweden

Filed May 29, 1969, Ser. No. 828,933
Claims priority, application Sweden, Dec. 18, 1968, Feb. 26, 1969, 17319/68;2586/69
Int. Cl. B65g *47/26*
U.S. Cl. 198—26 **1 Claim**



A conveyor assemblage for boards or pieces of lumber for obtaining a uniform flow rate of such items in which means are provided for arresting the boards arriving from a frame saw or the like, and for permitting the boards to arrive at a predetermined position with respect to the lugs of the high-speed conveyor, means are provided for releasing one board at a time, at predetermined time intervals, from the arrested position, accelerating the boards toward the high-speed conveyor and delivering the boards onto the conveyor between the lugs.

3,608,696

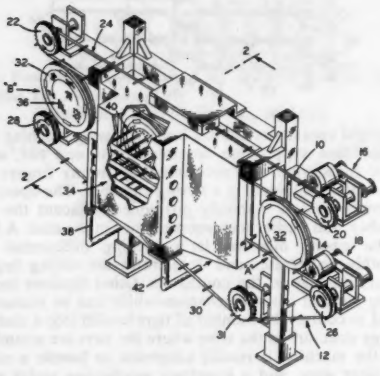
PROCESS AND APPARATUS FOR CHEMICAL MILLING

Joseph P. Lagermasini, Towanda, and Leadom A. Warner, Sayre, both of Pa., assignors to Sylvania Electric Products Inc.

Filed Feb. 16, 1970, Ser. No. 11,742
Int. Cl. B65q *15/14;* **B65g** *47/24*
U.S. Cl. 198—33 **7 Claims**

An improved process for selectively etching a pattern into a base material by the photochemical method using a photoresist coating over the base material to enable the exposure of an etching solution to selected portions of the base material wherein the article to be etched is coated with the photoresist material and is thereafter continuously advanced and

rotated at relatively uniform rates past a stationary spray of etching solution. A conveying system is also disclosed that is capable of simultaneously rotating and linearly advancing an article. The apparatus comprises a first and second spaced-apart conveyor, a movable article carrier therebetween and in engagement with the conveyors and a driving means for each conveyor. The conveyors comprise a driving sprocket, an idler sprocket and an endless carriage in engagement with



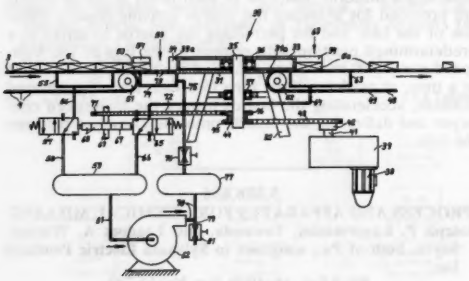
the sprockets. The endless carriage comprises a core and substantially equally spaced protrusions extending from each side of the core that engage the toothlike configuration of the periphery of each side of the sprockets. The carriages of each conveyor engages the article carrier to provide the linear movement. Differing the linear speeds or direction of travel of the two carriages enables variations in the rotational and linear movement of the article carrier.

3,608,697

APPARATUS FOR TRANSPORTING CIGARETTE PACKS IN PACKING MACHINES

Gunter Wahle, Reinbek; Heinz-Christen Lorenzen, Hamburg, and Anton Baier, Hamburg, all of Germany, assignors to Hauni-Werke Korber & Co. KG., Hamburg, Germany

Filed Feb. 20, 1969, Ser. No. 800,959
Claims priority, application Germany, Feb. 22, 1968, H 65396 VIIb/81a
Int. Cl. B65g *47/26*
U.S. Cl. 198—34 **18 Claims**



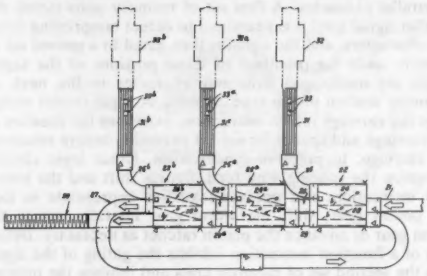
Apparatus for transporting cigarette packs to or from the cells of a rotary turret in a packing machine comprises a foraminous belt whose upper stretch transports the packs, a chamber adjacent to the underside of the upper stretch and having an open upper side which is overlapped by the belt, and a blower which circulates air through the chamber and the perforations of the belt, either in a direction to evacuate air from the chamber whereby the packs which travel with the upper stretch are drawn against the belt during travel along the open side of the chamber, or in a direction to expel air from the chamber and through the perforations of the belt so that such air forms a cushion which reduces friction between the upper stretch and the packs.

3,608,698

CONVEYOR SYSTEM AND SWITCH CONVEYOR

Russell D. Crall, Dallas, Tex., assignor to Stewart Engineering & Equipment Company, Richardson, Tex.

Filed May 26, 1969, Ser. No. 827,628
Int. Cl. B65g *37/00*
U.S. Cl. 198—81 **18 Claims**



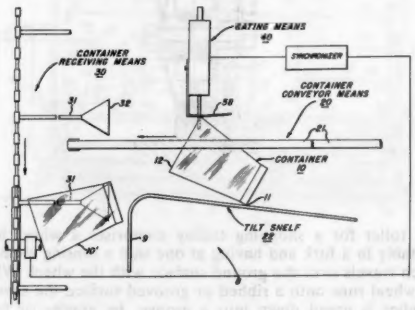
A conveyor system having a plurality of switch conveyors for selectively moving articles delivered by a delivery conveyor to a plurality of spaced locations or stations and to a recirculating conveyor if all the stations are not in condition to accept the articles, the recirculating conveyor moving the articles back to the switching conveyors. A switching conveyor usable in the system which has a pair of parallel switch means which are movable to deliver the articles delivered thereto selectively to two different locations.

3,608,699

CONTAINER TRANSPORT APPARATUS

Arthur A. Voris, Jr., Inglewood, Calif., assignor to Standard Oil Company, Chicago, Ill.

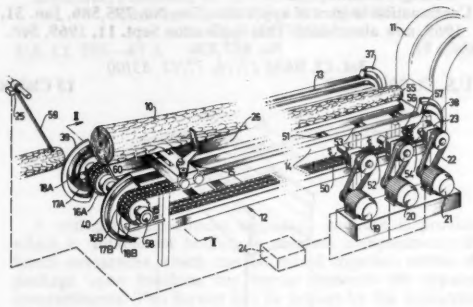
Filed Apr. 10, 1969, Ser. No. 815,081
Int. Cl. B65g *37/00*
U.S. Cl. 198—102 **4 Claims**



The disclosure describes a container transport apparatus comprising conveyor means for conveying containers along a predetermined path, container-receiving means positioned at the end of the conveyor means, and gating means, positioned in advance of the container-receiving means and above the

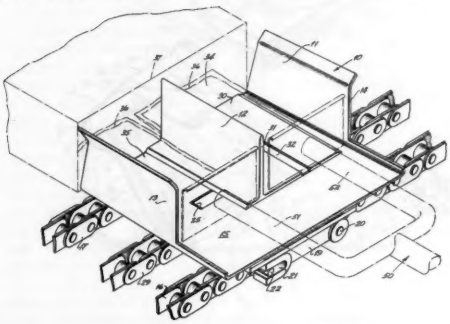
path of the containers. The gating means is in synchronization with the container-receiving means thereby effecting a continuous flow of containers from the conveyor means to the receiving means.

3,608,700
INFEED CONVEYOR
Philip Nilsson, Soderhamn, Sweden, assignor to Kockum Soderhamn Aktiebolag, Soderhamn, Sweden
Filed Dec. 12, 1969, Ser. No. 884,654
Int. Cl. B65g *15/00*
U.S. Cl. 198—179 **8 Claims**



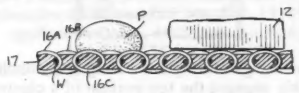
An infeed conveyor for feeding elongated material such as logs or blocks into a sawing machine, a logging machine or the like. The infeed conveyor is provided with carriages guided in an endless path for carrying one end of a log or block to a sawing or logging machine and then returning to a standby position. According to the invention, the infeed conveyor comprises at least two independently driven endless conveyor means disposed in parallel, e.g., in the form of conveyor chains arranged in pairs. Each of the conveyor means is arranged to drive one of the carriages that carry one end of a log or block. Beneath the path of movement of the carriages there is provided a trough for guiding the other end of each conveyed log or block in a longitudinal direction in a centered position relative to a central, vertical and longitudinal plane through the infeed conveyor. In addition, each carriage is provided with a centering member for centering and holding the ends of the logs which are carried thereby in the longitudinal central plane. Finally, the infeed conveyor is provided with control means for controlling the driving of the carriages in dependence upon the advance of the logs to the conveyor.

3,608,701
PRODUCT BUCKET FOR CARTONING MACHINE
Julian A. Dieter, Cincinnati, Ohio, assignor to R. A. Jones and Company, Inc., Covington, Ky.
Filed June 3, 1969, Ser. No. 830,064
Int. Cl. B65g *17/12*
U.S. Cl. 198—189 **10 Claims**



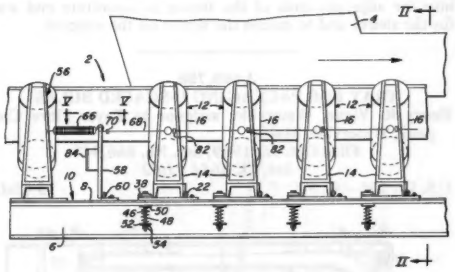
A product bucket for an automatic cartoning machine having a channel-shaped element adapted to be carried by a first conveyor chain and an adjustable divider element mounted on said channel-shaped element and adapted to be carried by a second conveyor chain, the conveyor chains being adjustable with respect to each other to vary the position of the divider element with respect to the channel-shaped element.

3,608,702
CONVEYOR BELT
Joseph Fraioli, Sr., 300 Martin Ave., White Plains, N.Y.
Filed Sept. 29, 1969, Ser. No. 861,645
Int. Cl. B65g *15/42*
U.S. Cl. 198—193 **7 Claims**



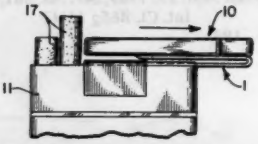
A conveyor belt for transporting impressionable articles such as baking dough without sticking or slippage, the face of the moving belt slidably engaging the undersurface of rails or other fixed elements. The belt is constituted by a reinforcing core of interlinked wire coils or woven wire mesh having a low coefficient of friction, almost entirely embedded in a layer of silicone rubber or other nonadhesive material having a high coefficient of friction, whereby only the upper points of the core are exposed. These points make contact with the undersurface of the rails to facilitate a sliding action therebetween, whereas the articles are impressed by the points and mainly engage the high drag surface of the layer.

3,608,703
CONVEYOR BELT PROTECTION DEVICE
Frank J. Hitchcock, and William L. Jones, both of Lander, Wyo., assignors to United States Steel Corporation
Filed Apr. 8, 1970, Ser. No. 26,486
Int. Cl. B65g *43/02*
U.S. Cl. 198—232 **8 Claims**



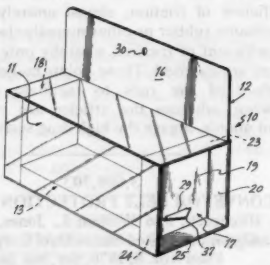
A belt conveyor has a table on which are pivotally mounted one or more idler roll assemblies in the loading zone. These assemblies have limited tilting movement away from the direction of belt approach with the tilting movement being resisted by springs. Under normal conditions there is no tilting movement, but under abnormal loads the assemblies tilt and stop the conveyor.

3,608,704
COMBINED CIGARETTE LIGHTER CASING AND SLIDABLE CLOSURE
Yvette Boasso Kopp, 856 Hidalgo St., New Orleans, La.
Continuation-in-part of application Ser. No. 734,844, June 4, 1968, now abandoned, Continuation-in-part of application Ser. No. 734,846, June 4, 1968, now abandoned. This application June 6, 1969, Ser. No. 831,137
Int. Cl. A24f *15/00*; B65d *85/10*
U.S. Cl. 206—41.3 2 Claims



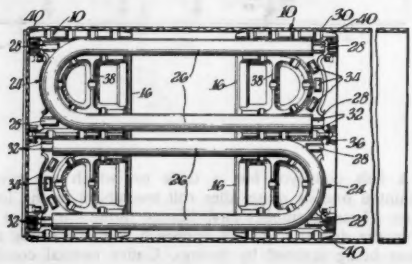
A combined cigarette lighter casing and attachment clasp which slidably engages the top portion of a cigarette pack to provide a convenient placing of the lighter and a slidable closure for the pack.

3,608,705
DISPLAY PACKAGE
Martin B. Moshel, Westwood, N.J., assignor to Miner Industries, Inc., New York, N.Y.
Filed Apr. 8, 1970, Ser. No. 26,644
Int. Cl. B65d *25/00*
U.S. Cl. 206—45.31 5 Claims



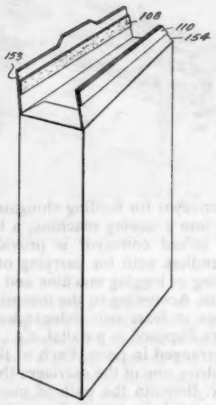
A display package includes a laterally extending, open-ended transparent sleeve of rectangular cross section to contain an article to be displayed in the package, and a support of cardboard or other flexible sheet material having a back panel extending along length of the sleeve in back of the latter, and preferably projecting above the sleeve, and extensions foldably joined to the ends of the back panel and folded into the adjacent ends of the sleeve to constitute end walls for the sleeve and to mount the sleeve on the support.

3,608,706
TRAY FOR PACKAGING U-SHAPED BULBS
Henry R. Vigue, Waterville, assignor to Keyes Fibre Company, Waterville, Maine
Filed Oct. 16, 1969, Ser. No. 866,947
Int. Cl. B65d *43/02*
U.S. Cl. 206—46 FR 13 Claims



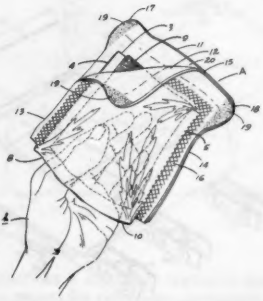
A molded tray for packaging U-shaped bulbs includes a bottom wall having upwardly extending sidewalls which terminate in a peripheral rim. At least one U-shaped bulb-receiving pocket is on the bottom wall with the legs of the pocket terminating at the rim and the bight of the pocket terminating short of the rim. Upstanding crushing resistance means or ribs are on the bottom wall to define the U-shaped pocket. A plurality of spaced resilient pads are in the U-shaped pocket and extend above the bottom wall a lesser amount than the crushing resistance ribs.

3,608,707
PACKAGE CLOSURE
Harmon B. Miller, Atlanta, Ga., assignor to Reclosable Package, Atlanta, Ga.
Continuation-in-part of application Ser. No. 795,586, Jan. 31, 1969, now abandoned. This application Sept. 11, 1969, Ser. No. 857,036
Int. Cl. B65d *27/16*, *77/12*, *85/00*
U.S. Cl. 206—46 F 15 Claims



A tape comprising two layers of flexible sheet material bonded together by pressure-sensitive adhesive. The outer surfaces of the sheet material are coated with a permanent-type adhesive such as a heat seal material. The tape is heat sealed between facing members of a package closure. Access to the package is gained by separating the sheet members and the package can be reclosed by means of the pressure-sensitive adhesive.

3,608,708
APPLICATOR MITT
Duane L. Storandt, 8744 Rankin, Brentwood, Mo.
Filed Oct. 8, 1969, Ser. No. 864,608
Int. Cl. A471 *13/19*; B65d *85/00*
U.S. Cl. 206—46 R 6 Claims



An applicator mitt having a normally open chamber for receiving the user's hand, a treated pad attached to the ex-

terior portion of said hand chamber, and protective covers jointed to the opening adjacent margin of said chamber and detachably connected along their remaining confronting margins for enclosing said pad when connected and forming a gauntlet when detached; there being retainer members formed with said covers for securing same into both positions.

3,608,709

MULTIPLE COMPARTMENT PACKAGE

Brian R. Pike, Sylmar, Calif., assignor to V. Wayne Rogers, Pasadena; William S. Schneider, Glendale and Carl F. Schneider, Peninsula, all of, Calif., part interest to each

Filed Sept. 8, 1969, Ser. No. 856,099
Int. Cl. B65d *79/00*
U.S. Cl. 206—47 A **19 Claims**

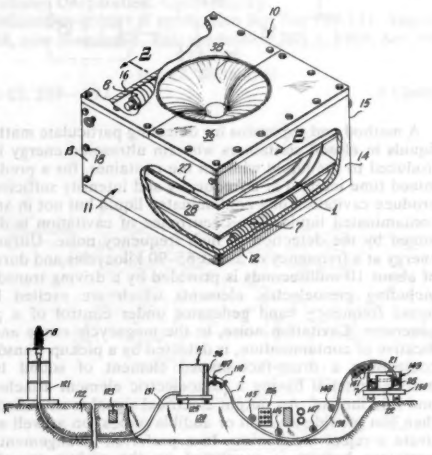
A multiple-compartment laminated package is provided which is suitable for holding in separate compartments different substances which can be mixed together within the package upon breaking the barrier between the separate compartments. This barrier can be broken by the application of external pressure to the package which applies tension to an inner layer of the outer wall of the package, such rupture of the inner layer taking place at a controlled location by virtue of a reduction in the bond strength between the inner layer and the next adjoining layer of the outer wall of the package.

3,608,710

HIGH VOLTAGE CABLE SYSTEM WITH FACTORY INSTALLED POTHEADS AND METHOD OF INSTALLING SAME

Paul F. Pugh, 4082 Sequoyah Road, Oakland, Calif.

Filed Nov. 20, 1968, Ser. No. 777,415
Int. Cl. B65d *85/04*; **B65h** *49/00*; **H02g** *1/06*
U.S. Cl. 206—52 W **13 Claims**



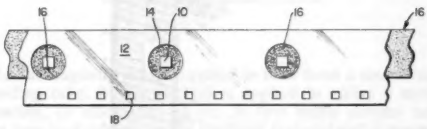
The high-voltage cable system and its preattached potheads facilitate installation of cable in underground work. The method of installation using the improved cable package of this invention permits rapid installation without the necessity of expensive field splicing of the cable to the pothead. Pressure accumulators located within the potheads maintain a positive pressure in the cable system to avoid contamination of the insulating oil. A unique oil submerged, ultrashort pothead and automatic oil purifier form another feature of the system.

3,608,711

PACKAGE FOR ELECTRONIC DEVICES AND THE LIKE

Mordechai Wiesler, Lexington, and John S. MacIntyre, Lynnfield, both of Mass., assignors to Teledyne, Inc., Hawthorne, Calif.

Continuation-in-part of application Ser. No. 665,635, Sept. 5, 1967, now Patent No. 3,497,948, dated Mar. 3, 1970, and a continuation-in-part of 785,209, Dec. 19, 1968. This application Oct. 6, 1969, Ser. No. 866,793
Int. Cl. B65d *85/30, 73/02*
U.S. Cl. 206—56 A **11 Claims**



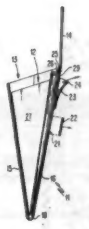
Small, fragile products such as transistors, diodes and integrated-circuit dice are packaged on a tape which may be indexed through various production stages. The tape is formed with spaced apertures closed on one side by means of a pressure-sensitive adhesive wall bonded to one side of the tape. Devices are dropped onto the wall and adhere thereto. Sprocket holes are formed along the marginal edge of the tape for engagement with an indexing drive mechanism.

3,608,712

WASTE RECEPTACLE

Wilfred R. Savoie, 9 Martin Road, Poughkeepsie, N.Y.

Filed Jan. 14, 1970, Ser. No. 2,795
Int. Cl. B65d *5/60*
U.S. Cl. 206—57 A **2 Claims**



A reusable waste receptacle includes: an outer container having foldable sidewalls and a bottom V-shaped in cross section; and, in inner array of disposable bags in vertically disposed relation, the innermost bag resting against the rear wall of the container, the outermost bag covering the remain-

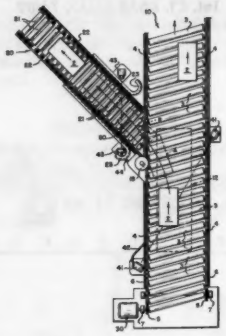
ing bags, and when in use being supported by the V-shaped bottom of the outer container. An interlockable lid holds the container in compact closed position. When opened, however, the container snaps open and the outermost bag folds into place. Adhesive strips on the container and a removable punch in the rear wall of the container allow same to be held by or affixed to a supporting means.

3,608,713

SKEWED ROLL SORTATION SYSTEM

Peter F. Crosby, Cazenovia, N.Y., and John H. Lawrence, Decatur, Ga., assignors to American Chain & Cable Company, Inc., New York, N.Y.

Filed Dec. 17, 1969, Ser. No. 886,052
Int. Cl. B07c *5/00*
U.S. Cl. 209—74 **9 Claims**



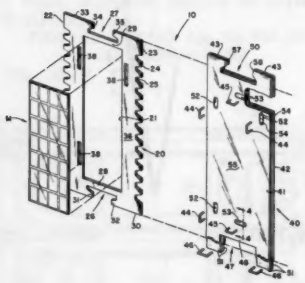
A sortation conveyor system for selectively distributing articles from a main conveyor to one or more branch conveyors including a main conveyor equipped with a moving bed of freely rotating rollers skewed in the general direction of the branch conveyor and a drive element selectively engageable with the skewed rollers upstream of the branch conveyor to cause rotation thereof and movement of the overlying articles laterally toward the branch conveyor.

3,608,714

INFORMATION STORAGE AND RETRIEVAL SYSTEM

David Cox, Stratford, Conn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 13, 1970, Ser. No. 36,822
Int. Cl. B07c *3/20*
U.S. Cl. 209—80.5 **20 Claims**



An information unit is provided which comprises a substantially rectangular plate and a carrier therefor. The plate has a arrangement, of opposite longitudinal edges which are encoded with identifying notch and land configurations. The opposite end portions of the plate are shaped to respectively define a pair of opposed hooklike members. The carrier has a pair of opposite walls between which are sandwiched the faces of the plate. The plate and the carrier are connected in sliding relation for parallel movement in opposite directions between a first relative position wherein the identifying configurations and only the first of the hooklike members are exposed and a second relative position wherein the identifying configurations and only the second of the hooklike members are exposed.

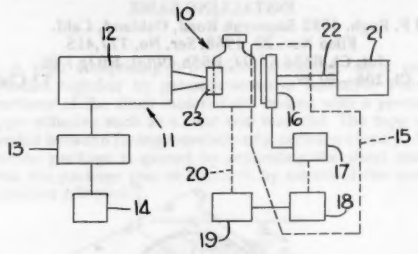
Information units of the type described are vertically supported in a stacked arrangement with each respectively connected plate and carrier disposed in its first relative position, by an information unit retrieval apparatus. Undesired ones of the respectively connected plates and carriers are moved from their first relative position to their second relative position in response to actuation of a carrier moving assembly and individual members selectively engageable with the corresponding notches in each of the arranged plates. Desired ones of the respectively connected plates and carriers remain in their first relative position as those lands of the former that would ordinarily be engaged by the members are removed. Thereafter, a pair of opposed movable bars are brought into engagement with the first of the exposed hooklike members to affirmatively extract the desired information units from the arrangemn, while another pair of opposed movable bars, brought into engagement with the second of the exposed hooklike members, affirmatively hold the undesired information units in the arrangement.

3,608,715

METHOD AND APPARATUS FOR INSPECTING LIQUIDS

Herbert C. Snyder, Brockway; Lewis W. McFadden, Brockway; Clyde W. Dickey, State College, and Louis V. Mancuso, Reynoldsville, all of Pa., assignors to Brockway Glass Company, Inc., Brockway, Pa.

Filed Feb. 6, 1970, Ser. No. 9,236
Int. Cl. G01n *29/02;* **B07c** *5/34*
U.S. Cl. 209—111.9 **16 Claims**



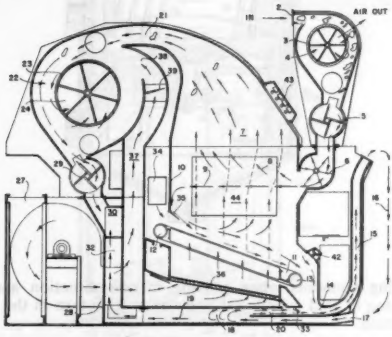
A method and apparatus for detecting particulate matter in liquids in closed containers wherein ultrasonic energy is introduced to the liquid while in the container, for a predetermined time interval at a frequency and intensity sufficient to produce cavitation in a contaminated liquid but not in an uncontaminated liquid. The occurrence of cavitation is determined by the detection of high frequency noise. Ultrasonic energy at a frequency of about 65–90 kilocycles and duration of about 10 milliseconds is provided by a driving transducer including piezoelectric elements which are excited by a broad frequency band generator under control of a pulse generator. Cavitation noise, in the megacycle range and indicative of contamination, is detected by a pickup transducer comprising a drum-face-shaped element of sound transmitting material having a piezoelectric element attached to one side thereof. An output electrical signal is amplified and then can provide a visual or audible indication as well as activate a reject mechanism. In a preferred arrangement, the container bottom is supported on the pickup transducer which is apertured to allow passage therethrough of an end of the driving transducer, both transducers being supported in an hydraulic liquid in a self-leveling arrangement whereby regardless of the curvature of the container bottom, intimate contact is achieved between the container bottom and both transducers.

3,608,716

RECIRCULATING PNEUMATIC SEPARATOR

Lorne A. Rowell, Lachine, Quebec, and Peter A. Tillich, Monreal, Quebec, both of Canada, assignors to Imperial Tobacco Company of Canada Limited, Montreal, Quebec, Canada

Filed Jan. 27, 1969, Ser. No. 794,000
Int. Cl. B07b 4/08
U.S. Cl. 209—139 R 11 Claims



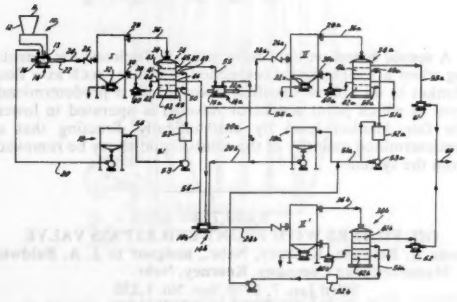
This invention relates to a recirculating pneumatic separator which is particularly designed for separating threshed tobacco leaves form the heavier tobacco parts. The lighter tobacco fraction is carried up by air which is recirculated through the separator and the heavier tobacco function falls to an endless belt and is separately conveyed out of the separator. Means is provided for accurately controlling the air velocity in the separation chamber and for ensuring complete separation of the tobacco fractions by means of an air jet impeller.

3,608,717

METHOD AND APPARATUS FOR THE LIQUID SEPARATION OF A MIXTURE OF MATERIALS

David G. Strubel, Jeffersontown, and Nicholas E. Ludwig, Louisville, both of Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Continuation-in-part of application Ser. No. 750,131, Aug. 5, 1968, now abandoned. This application July 1, 1969, Ser. No. 838,158
Int. Cl. B03b 3/40
U.S. Cl. 209—172 4 Claims



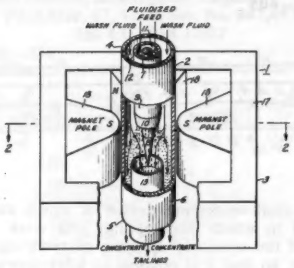
Method for separating particles of different specific gravities and absorption characteristics in a heavy liquid medium.

3,608,718

MAGNETIC SEPARATOR METHOD AND APPARATUS

William M. Aubrey, Jr., Bethlehem; Janusz M. Karpinski, Bethlehem, Pa.; David S. Cahn, Upland, Calif., and Conrad J. Rauch, Acton, Mass., assignors to Bethlehem Steel Corporation

Continuation-in-part of application Ser. No. 676,297, Dec. 8, 1967, now abandoned. This application Dec. 20, 1968, Ser. No. 804,336
Int. Cl. B03c 1/14, 1/26
U.S. Cl. 209—214 37 Claims



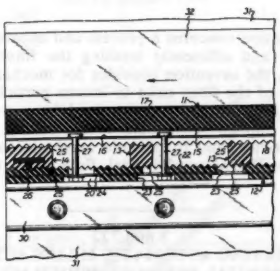
Radial magnetic field is applied in tube from a source surrounding tube. Magnetic field is applied in either a static, pulsating, or alternating mode. A first baffle divides tube inlet into feed inlet receiving fluidized material and surrounding coaxial passage receiving wash fluid. A second baffle spaced downstream of the first baffle divides tube outlet into tailings discharge and surrounding coaxial concentrate discharge. Magnetic and magnetizable particles are attracted outwardly between baffles from central fluidized material stream and leave as a concentrate discharged with wash fluid. Nonmagnetic particles in central fluidized material stream leave tailings discharge. Fluid stream within tube has no outward radial components and may have inward radial components.

3,608,719

SELF-SUPPORTING SCREENS FOR STONE, ORE AND LIKE MATERIAL

Bengt Lars Arne Dehlen, Trelleborg, Sweden, assignor to Trelleborgs Gummifabriks Aktiebolag

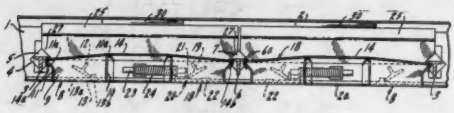
Filed Mar. 11, 1969, Ser. No. 806,242
Claims priority, application Sweden, Mar. 14, 1968, 3351/68
Int. Cl. B07b 1/04
U.S. Cl. 209—394 4 Claims



A self-supporting screen for sorting stone, ore and like material having apertures of adjustable size. Two crossed sets of bars are detachably clamped together to form screen lattice. The rods are coated with a wear-resistant natural or synthetic rubber, and at least the bars in one rod set are reinforced to impart self-supporting ability to the screen. The bar sets have cooperating ridges and toothlike projections to fix

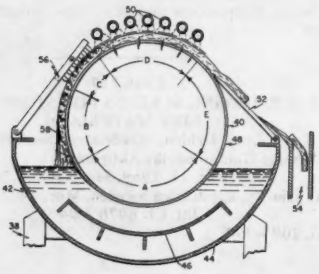
the positions of the bars in the two bar sets in relation to each other. One bar set may then be displaced with respect to the other bar set utilizing the cooperating ridges and projections to provide a screen having apertures of adjustable size.

3,608,720
SCREEN-CLOTH-SECURING MEANS
Edgar P. Symons, Hollywood, Calif., assignor to Symons Brothers Co., North Hollywood, Calif.
Filed May 7, 1969, Ser. No. 822,611
Int. Cl. B07b *1/46*
U.S. Cl. 209—405 **7 Claims**



A screen-cloth-tensioning device in which cloth is tensioned, and in which the operator can work within the periphery of the screen in applying or removing tensioned screen cloth, so that it is possible to work down through a multideck screen structure, the work being done primarily within the periphery of the screen.

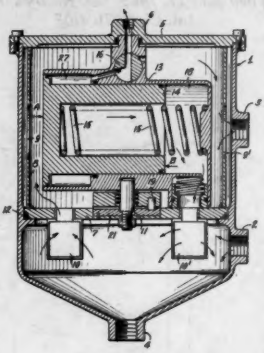
3,608,721
METHOD FOR FILTRATION OF SLURRIES
Edwin B. Lopker, Fort Lauderdale, Fla., assignor to Pullman Incorporated, Chicago, Ill.
Filed Mar. 11, 1969, Ser. No. 806,087
Int. Cl. B01d *25/28*
U.S. Cl. 210—66 **4 Claims**



This invention concerns a process and apparatus for filtering slurries and efficiently washing the filter cake. More specifically, the invention provides for mechanically raking the surface of the filter cake to loosen particles therefrom. The loosened particles are entrained by a wash liquid or other fluid applied subsequent to the raking step; the entrained particles tend to occlude cracks in the filter cake, thereby eliminating preferential fluid flow through such cracks.

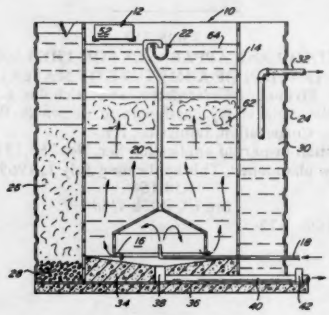
3,608,722
FILTER HAVING AUTOMATIC MEANS ACTUATED BY DIFFERENTIAL PRESSURE, WHICH MEANS ARE EASILY ACCESSIBLE
Marcel Picard, Rue Pasteur, Saint-Aigulin, Charente Maritime, France
Filed Jan. 21, 1969, Ser. No. 792,696
Claims priority, application France, Jan. 22, 1968, 137,139
Int. Cl. B01d *29/38*
U.S. Cl. 210—108 **4 Claims**

Filter comprising a plurality of filtering elements and having a self-cleaning device consisting of a differential piston cooperating with a pivotally mounted cylindrical body, said piston controlling a distributing spigot whereby to insure the cleaning of one filtering element in turn among said multiple



filtering elements when moving in one direction and the pivoting of said cylindrical body upon its return in the other direction.

3,608,723
FLOC BLANKET LEVEL CONTROLLER COMPRISING MEANS FOR SENSING LIGHT DIFFUSELY REFLECTED FROM THE FLOC BLANKET
David Brown, Lansdale, Pa., assignor to Met-Pro Water Treatment Corp., Lansdale, Pa.
Filed Dec. 5, 1968, Ser. No. 783,171
Int. Cl. C02c *1/20*; B01d *21/24*; G01n *21/26*
U.S. Cl. 210—114 **6 Claims**

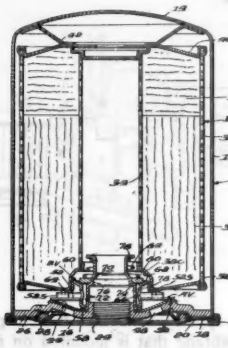


A sensor based on light reflectance is disclosed for detecting when a hydraulically suspended interface, such as a floc blanket in an upflow clarifier, has reached a predetermined level at which point a control valve(s) is operated to lower the floc blanket level by automatically directing that a predetermined quantity of the solids/liquid slurry be removed from the system.

3,608,724
OIL FILTERS WITH FRONT-END BYPASS VALVE
Jesse A. Baldwin, Kearney, Nebr., assignor to J. A. Baldwin Manufacturing Company, Kearney, Nebr.
Filed Jan. 7, 1970, Ser. No. 1,238
Int. Cl. B01d *35/14, 27/10*
U.S. Cl. 210—130 **7 Claims**

An oil filter incorporating a front-end bypass valve interposed between the baseplate providing the front or bottom closure of the filter shell and a filter element contained therein. Said bypass valve is so constructed as to provided a

relatively elongated and unobstructed annular oil flow channel therethrough which at its lower end is in full open communication with the interior space of the filter adjacent its lower, oil-entering end and whose upper end connects to the oil outlet opening of the filter via a ring valve which is urged to its seated, channel-closing position by a spring reactive against its upper face. The arrangement is such that when oil pressure within the interior space of the filter, and which is always effective on the under face of the ring valve, exceeds



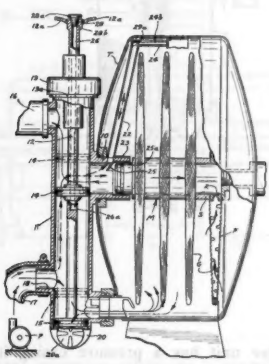
the seating force exerted by said spring on the upper face thereof, due to normal oil flow through the filter element being restricted because of clogging or the oil being too viscous as to readily flow therethrough, the bypass valve provides an alternate path of oil flow between the filter oil inlet and filter oil outlet openings, which path is characterized by a minimum obstruction and is further sufficiently elongated as to reduce restriction of oil flow due to turbulence caused by change of oil flow direction.

3,608,725

AUTOMATIC, SELF-CLEANING AIR RELIEF SYSTEM FOR DIATOMACEOUS EARTH FILTER TANKS

William A. Oden, Temple City, Calif., assignor to Domain Industries, Inc., New Richmond, Wis.

Filed Oct. 13, 1969, Ser. No. 865,730
Int. Cl. E04h *3/16*
U.S. Cl. 210—169 **5 Claims**



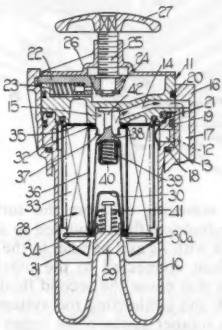
A system and apparatus for combination with conventional water filter systems for pools and the like which continually relieves accumulation of air in the filter tank and redistributes such air to the pool or other reservoir. The system employs an upwardly extending air withdrawal passage filtered at its upper end for entrance of air at the top of the filter tank, and having communication at its lower end with the effluent discharge or water stream emanating from the manifold or other main discharge of cleansed water from the filter tank. The apparatus also preferably includes a water diverting means for deflecting water through the air withdrawal passage in backwash operation of the general filtering system to thus clean the filter of the air withdrawal passage.

3,608,726

LIQUID-FILTERING EQUIPMENT

Harold Crowther, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Mar. 17, 1969, Ser. No. 807,497
Int. Cl. B01d *35/02*
U.S. Cl. 210—234 **13 Claims**



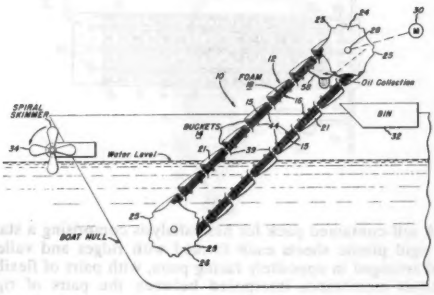
A filter has a cup-shaped housing, which includes a liquid inlet, and a lid which includes a liquid outlet. The liquid inlet opens tangentially into a groove around the interior of the mouth of the housing. A baffle covers the groove opening and itself has openings through which the liquid passes. A filter element is mounted centrally within the housing and is surrounded by a sleeve which directs the liquid entering through the baffle towards the closed end of the housing before it passes through the filter to the outlet.

3,608,727

APPARATUS FOR REMOVING OIL AND DEBRIS FROM WATER

James F. Grutsch, Hammond, and Russell C. Mallatt, Crown Point, both of Ind., assignors to Standard Oil Company, Chicago, Ill.

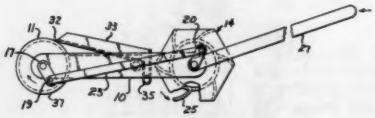
Filed Mar. 18, 1970, Ser. No. 20,508
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **6 Claims**



Oil, solid particles such as biological slime and floating debris etc. are removed from water by an apparatus including

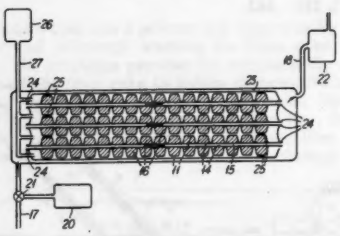
endless chain means made up of a series of interconnected foraminous chambers holding a regenerable porous filter material such as polyurethane. Preferably the filter material has an outer large pore section and an inner small pore section. A plurality of buckets are attached to the chain means, and as the chain means moves through a closed loop path, these buckets catch debris and dump it into a holding bin. Simultaneously, the filter material absorbs surface and subsurface oil and the like from water traveling through the filter material. The filter material is regenerated by squeezing the filter material to release the oil.

3,608,728
OIL SKIMMER
Leslie E. Trimble, 1341 West Vista Way, Vista, Calif.
Filed Oct. 15, 1969, Ser. No. 866,561
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **7 Claims**



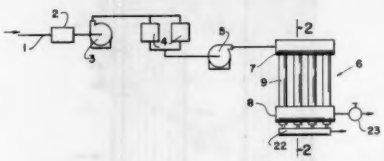
A skimmer for removing oil from the surface of water which includes a cylindrical float mounted to a frame so that the float may rotate with its axis parallel to the surface of the water, a second float connected to the other through the frame with paddles that cause the second float to rotate and actuate a bellcrank and connecting rod system to rotate the cylindrical float. A scraper contacts the upper surface of the cylindrical float to remove oil collected on the surface of the float and allows it to drain down the trough in the scraper into a drainpipe that will flow the oil into a reservoir for storage. In operation, a push-bar frame is attached to the second float having paddle vanes and the entire apparatus would be pushed by a boat, thereby using the motion through the water to actuate the paddle wheel to rotate the oil skimmer float to pick up oil from the surface.

3,608,729
DISPOSABLE DIALYSER PACK WITH ADSORBENT
Geoffrey Gordon Haselden, Leeds, England, assignor to National Research Development Corporation, London, England
Filed Sept. 27, 1968, Ser. No. 763,269
Claims priority, application Great Britain, Sept. 27, 1967, 43954/67
Int. Cl. B01d *13/00*
U.S. Cl. 210—321 **11 Claims**



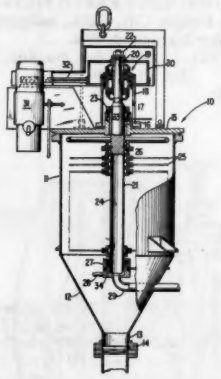
A self-contained pack for hemodialysis comprising a stack of rigid plastic sheets each formed with ridges and valleys and arranged in oppositely facing pairs, with pairs of flexible dialysis membranes interposed between the pairs of rigid sheets in the stack. The spaces between the paired membranes serve as blood flow passages, while the ridges of the rigid sheets provide support for the membranes. The spaces in the valleys between the ridges are packed with adsorbent material, e.g. an ion-exchange resin, immersed in nonflowing dialysis fluid.

3,608,730
DESALINATION APPARATUS
Emil Blaha, Cheltenham, Pa., assignor to Selas Corporation of America, Dresher, Pa.
Filed Oct. 2, 1969, Ser. No. 863,125
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **4 Claims**



A desalination apparatus in which there is provided a thin desalination membrane that is mounted on a rigid, porous support. The membrane and its support are concentrically located in a tube through which water to be treated is forced under pressure.

3,608,731
CENTRIFUGAL DISCHARGE FILTER SEALS
Ernie G. Seggebruch, East Moline, Ill., assignor to Ametek, Inc., New York, N.Y.
Filed Jan. 16, 1970, Ser. No. 3,365
Int. Cl. B01d *29/02*
U.S. Cl. 210—331 **4 Claims**



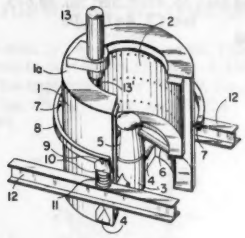
A rotary filter unit has a pressure casing in which is rotatably mounted a shaft having filter means thereon. Both ends of the shaft are rotatably supported and are surrounded by inflatable sealing means which may be selectively inflated and deflated. When inflated, the sealing means engage the periphery of the shaft to provide a secure seal between the interior of the casing and the exterior thereof. When deflated, the inflatable sealing means are spaced from the periphery of the shaft.

3,608,732

CENTRIFUGE

Werner Steprath, Gohr/Neuss, Germany, assignor to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

Filed Nov. 5, 1969, Ser. No. 874,125
Claims priority, application Germany, Jan. 31, 1969, P 19 04 774.6
Int. Cl. B04b 9/12
U.S. Cl. 210—364 6 Claims



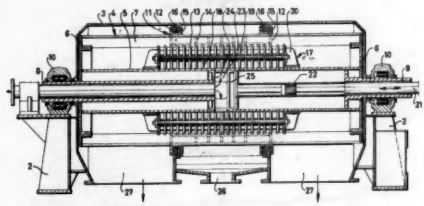
A centrifuge particularly for use for sugar extraction includes an outer protective jacket which is supported on a gimbal ring for resilient pivotal movement. The ring, in turn, is supported on resilient pivots for pivotal movement about an axis extending 90° to the pivotal mounting of the jacket. The centrifuge includes a drum mounted within the jacket for rotative movement. In one embodiment the drum is supported by and driven by an electric motor which in turn is carried on radially extending arms supported on the outer protective jacket. In another embodiment the driving motor is mounted on a stationary frame and the drum is driven by a telescopic drive shaft connected to the motor and to the respective drum through pivotal or universal joint constructions.

3,608,733

CENTRIFUGAL THICKENER

Alf Torsten Okvist, Berghult, Skarblacka, and Nils Olof Nilsmar, Stalringen, Kallhall, both of Sweden, assignors to Maskin A B N.A. Eie, Bandhagen, Sweden

Filed Sept. 17, 1968, Ser. No. 760,136
Int. Cl. B01d 33/38
U.S. Cl. 210—376 7 Claims



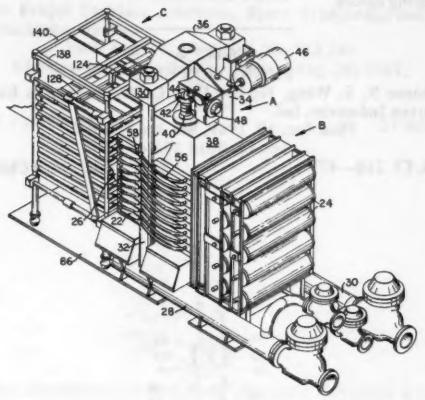
The present invention relates to a centrifugal thickener comprising a machine housing, which includes a rotatable thickening cylinder and feed and discharge means for the slurry. The invention is characterized in that the feed means is a pipe axially projecting through one end of the machine housing, and that the discharge means is rotatably connected with the thickening cylinder and axially movable in relation to the same.

3,608,734

LIQUID FILTERING APPARATUS

John R. Schneider, 26 Cove Road, Belvedere, Calif.

Filed July 31, 1968, Ser. No. 749,003
Int. Cl. B01d 25/04
U.S. Cl. 210—387 16 Claims



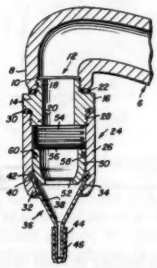
A filtering apparatus for handling a large volume of liquid to be filtered comprising a plurality of separable pairs of liquid containers, a continuous sheet of filter media between each container pair, and means for simultaneously moving all of the sheets of filter media when the portions between pairs of containers have become contaminated with accumulated dirt or sludge. The contaminated filter sheets are moved from between pairs of liquid containers which have been separated and are advanced until fresh filter media is in place between the pairs of liquid containers. When the new filter media is in place between separated containers they are pressed together to form a fluidtight seal around their edges, the filter media being positioned so the liquid flowing into each container passes through the filter media and then through an outlet. Movement of each filter media sheet is accomplished by a series of members that engage the media and then pull it forwardly before disengaging from the media and then moving backwardly to repeat the cycle. Separate series of engaging members are provided for each filter media sheet and are coordinated by a common control apparatus.

3,608,735

SPIGOT ADAPTER CONNECTION FOR PRESSURE HOSE

Leo R. Smith, 1203 South 28th St., Fort Pierce, Fla.

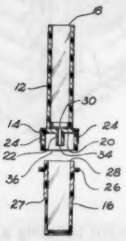
Filed Nov. 6, 1969, Ser. No. 874,464
Int. Cl. B01d 35/04
U.S. Cl. 210—449 10 Claims



A self-contained attachment which permits a hydraulic oral hygiene dental syringe to be operatively joined to a spigot. It is characterized by an adapter, coupling means con-

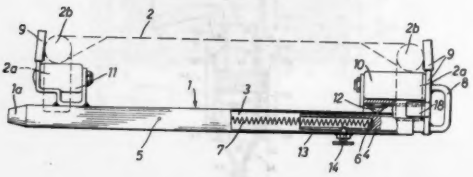
nected with the adapter, and a funnel-type connector, which also constitutes an adapter, and is carried by the coupling means and to which a hose is connected. In practice the usual filter-type spigot strainer unit is removed and replaced by the herein disclosed attachment which embodies, as one of its features, a built-in spring-loaded filtering screen or strainer. The overall attachment constitutes a spigot-to-hose filtering device.

3,608,736
FILTRATION UNIT
Johnson N. S. Wong, Harbor City, Calif., assignor to Evergreen Industries, Inc.
Filed Dec. 19, 1969, Ser. No. 886,642
Int. Cl. B01d *29/04*
U.S. Cl. 210—477 **9 Claims**



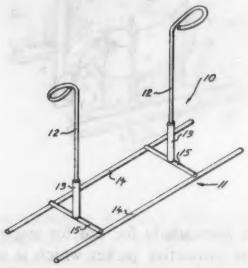
A disposable filtration unit for use with a specimen tube, including a hollow cylindrical filter column formed with a cap depending from the bottom of the column and dimensioned to fit the mouth of the specimen tube, the bottom of the column being formed with a depending discharge tip spaced axially centrally of the cap. The bottom of the filter column is formed with flat marginal portions and filter material is utilized in a form including flat sheet portions supported flush on the marginal filter column portions. The sample tube is formed with an exterior annular ridge spaced from its mouth and the cap is sized so as to engage the ridge to thereby space the bottom of the filter column from the mouth. One or more vent openings are defined in the cap between the sample tube mouth and the bottom of the filter column.

3,608,737
FRAME ASSEMBLY FOR SUPPORTING A STRETCHER
Hans Stollenwerk, 197-201 Dellbrucker Hauptstr, 5 Cologne-Dellbruck, Germany
Filed Nov. 10, 1969, Ser. No. 875,328
Claims priority, application Germany, Nov. 13, 1968, P 18 08 480.5-35
Int. Cl. A47f *7/00*
U.S. Cl. 211—13 **14 Claims**



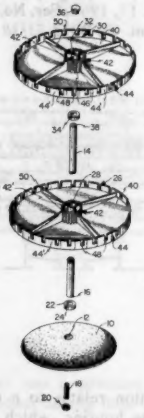
A frame assembly having at least two transverse bearer elements mounted in spaced relationship with respect to each other is provided to support a stretcher. Each of the elements includes a fixedly mounted section and a movably mounted section which have telescoping structural configurations. A biasing means is attached to each of the sections to telescope the sections with respect to each other. The frame assembly as provided is particularly useful for mounting in vehicles. Abutment members are mounted at each end of the elements with at least one of the abutments being secured to the fixedly mounted section and another abutment member being secured to the movably mounted section. Arresting means are provided to prevent movement of the fixedly mounted sections with respect to the movably mounted sections.

3,608,738
BOOT-DRYING RACK
Sally-Rae Andersen, 45152 Wells Road, Sardis, British Columbia, Canada
Filed May 26, 1970, Ser. No. 40,673
Int. Cl. A47f *7/08*
U.S. Cl. 211—38 **3 Claims**



A boot-drying rack having a base frame and removable upright supports for supporting boots in an inverted position over the base frame. The rack can be set over or near a hot air register so that heated air can circulate drying particularly the inside of the boots. Packs flat for packaging, and storage when not in use.

3,608,739
REVOLVING STORAGE TABLE
Philip L. Duboff, Kearny, N.J., assignor to Shelfmaker Products Corp., Kearny, N.J.
Filed Feb. 18, 1969, Ser. No. 800,057
Int. Cl. A47g *29/00*
U.S. Cl. 211—40 **5 Claims**

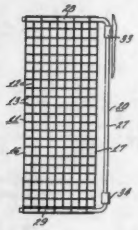


A novel revolving storage table is disclosed offering single- or double-tier storage of phonograph record albums and the like, the storage table further functioning as an occasional table. The storage table generally comprises a base member having an elongated pole extending vertically upwardly

thereof. First and second tray means are removably journaled for easy rotation on nylon collars or bearings disposed on the pole at a lower and upper tier or level, respectively. Each of the tray means includes record guide means on one surface thereof for vertically storing the records in a novel fashion such that the title of each record is visible to facilitate selection. The tray means disposed at the upper tier can be flipped over in a novel fashion to present a flat, smooth surface coextensive with the top of the elongated pole thus providing an occasional table.

3,608,740
DEVICE FOR SUPPORTING AND DISPLAYING NECKTIES

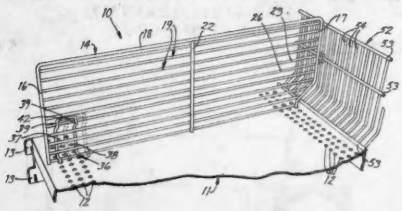
Charles E. Bowman, Jr., 414 Anderson St., Crown Point, Ind.
continuation-in-part of 628,374, Apr. 4, 1967, now abandoned. This application Apr. 7, 1970, Ser. No. 26,247
Int. Cl. A47f 7/19; A47j 51/24
U.S. Cl. 211—96 **4 Claims**



A device for supporting and displaying haberdashery, especially pretied neckties having supporting hooks built therein, comprising a yieldable foraminous surface mounted under slight tension to provide surfaces having a plurality of discrete supporting means defined therein upon which such ties may be hung and from which one may be removed independently of others suspended therefrom. The device is mountable in a vertical plane to provide access from either of two sides.

3,608,741
SHELF PARTITION

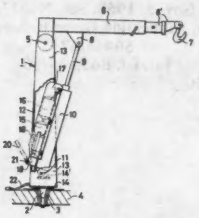
Walter H. Schray, Battle Creek, Mich., assignor to United Steel and Wire Company, Battle Creek, Mich.
Filed May 27, 1970, Ser. No. 40,999
Int. Cl. A47f 5/00
U.S. Cl. 211—184 **7 Claims**



A shelf partition adapted for use with a generally horizontal shelf having a plurality of rows of laterally spaced holes therein. The partition is of a wire mesh construction having a plurality of longitudinal and transversely related wire rods interconnected to each other. A slider member slidably engages at least one of the longitudinal wire rods for relative movement therealong. Foot means are provided on the slider member for selectively engaging one of the laterally spaced holes in the shelf to fixedly locate the partition relative to the shelf. The slider member, due to its sliding relation relative to the partition, may be adjusted longitudinally of the partition to permit an alignment of the foot means thereon with at least one of the laterally spaced holes in the shelf.

3,608,742
SMALL SIZE CRANE HAVING A HYDRAULICALLY OPERATED JIB AND AN ELECTROMOTOR-DRIVEN HYDRAULIC PUMP

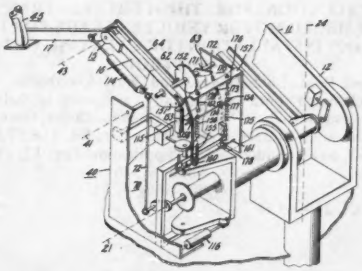
Karl Fritjof Torbjorn Adolfsson, Bjorn Tradgardsgrand 3, Stockholm, Sweden
Filed Aug. 16, 1968, Ser. No. 753,286
Claims priority, application Sweden, Aug. 30, 1967, 12015/67
Int. Cl. B66c 23/54
U.S. Cl. 212—35 **2 Claims**



An electromotor-driven small size crane comprises a rotary crane post presenting two spaced-apart sidewalls, a vertically swingable jib on said post and a hydraulic jack for actuating the jib, said jack normally occupying a forwardly inclined position relative to the crane post and including a cylinder having its rear end hingedly connected to the lower end portion of the crane post between said sidewalls thereof. An oil pump and an electromotor for driving the same are both mounted on the back of the cylinder so as to partake in the tilting movements of the latter during raising and lowering of the jib and so as to normally remain substantially sheltered between said sidewalls of the crane post. Preferably, said pump and motor are covered by a cap removably attached to the cylinder, which also carries an oil reservoir and valve means for operating the crane.

3,608,743
MATERIAL-HANDLING APPARATUS

Ralph S. Mosher, and Donald A. Kugath, both of Schenectady, N.Y., assignors to General Electric Company
Filed May 4, 1970, Ser. No. 34,159
Int. Cl. B25j 3/04
U.S. Cl. 214—1 CM **3 Claims**



An articulated boom having a single joint intermediate the ends thereof is pivoted at one end about a horizontal axis of a support member. The other end of the boom has end effectors and end effector positioning elements located thereon. A control member smaller in size but similar in form to the articulated boom having a single joint intermediate the ends thereof is also pivoted at one end about another horizontal axis of another support member and a handle is provided at the other end thereof. Means are provided to cause each of the two parts of the articulated boom to follow in orientation a respective one of the two parts of the control member in response to movement of the handle by an operator. Addi-

tional means are provided so that forces encountered by the articulated boom are reflected back, reduced in magnitude however, to the handle held by the operator.

A pair of assemblies of levers and springs are provided each in cooperative association with a respective part of the control member to counterbalance completely the weight of the unloaded control member and the weight of unloaded boom as reflected by force feedback to the control member.

3,608,744

TRANSFER DEVICE FROM FOOT-FORMING MACHINE TO BURN-OFF MACHINE

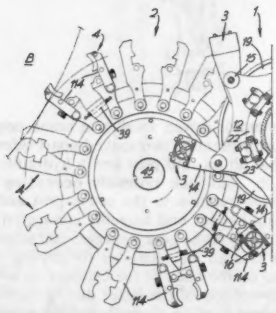
Francis Joseph Ward, Burtonwood, near Warrington, and Derek Grimes, St. Helens, both of England, assignors to Ravenhead Glass Limited, St. Helens, England

Filed Nov. 5, 1968, Ser. No. 773,405

Claims priority, application Great Britain, Nov. 6, 1967, 50444/67

Int. Cl. B65g *29/00*

U.S. Cl. 214—1 BC **13 Claims**



Article transfer apparatus particularly for use in glassmaking, comprises a first continuously rotating device carrying a plurality of pivotally mounted article-engaging members, and a second continuously rotating device carrying a plurality of article-gripping members adapted to receive articles from said article-engaging members, wherein said first and second devices rotate in the same direction and in synchronism, the pitch circles of the article-engaging members and the article-gripping members overlap, and means associated with the first device causes each article-engaging member to pivot to effect transfer of an article therefrom to an article-gripping member.

3,608,745

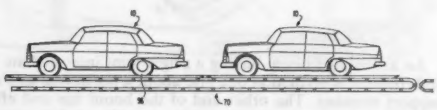
INSTALLATION FOR THE FURTHER TRANSFER OF ASSEMBLED MOTOR VEHICLES READY FOR DRIVING AND INSTALLATION FOR CARRYING OUT THE METHOD

Hubert Pohl, Sindelfingen, and Kurt Leonhardt, Stuttgart-Mohringen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Continuation-in-part of application Ser. No. 618,573, Feb. 27, 1967, now abandoned. This application Apr. 17, 1969, Ser. No. 824,346

Int. Cl. B65g *47/00*

U.S. Cl. 214—1 R **13 Claims**



An installation for the further conveyance or transport of assembled motor vehicles, ready for driving in which the assembled vehicles, ready for driving, are transported while supported on a conveyor base support which, in its length, projects beyond the front as well as the rear end of the vehicle, corresponds in width essentially to that of the vehicle and is provided with a holding device for at least one vehicle wheel whereby the conveyor base support, during nonuse can be transported individually. In a preferred construction, the conveyor base support consists of two separate runner-type guide members, each provided with a troughlike recess for a rear wheel of the vehicle and interconnected along the forward and rearward ends. A system of conveyor belts for transporting the vehicles on their respective supports includes at least one belt constructed in the form of a buffer belt.

3,608,746

APPARATUS FOR STACKING BRICKS AND OTHER ARTICLES

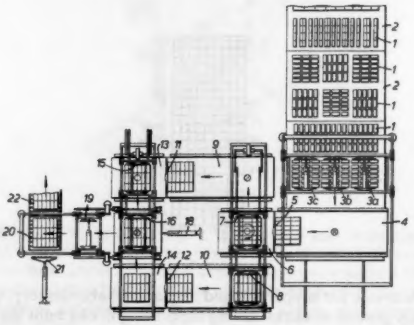
Alfred Meyer, Hasbergen, Germany, assignor to C. Keller u. Co., Laggenbeck am Westphalia, Germany

Filed Apr. 8, 1970, Ser. No. 26,517

Claims priority, application Germany, Apr. 9, 1969, P 19 18 017.7-22

Int. Cl. B65g *57/22*

U.S. Cl. 214—6 A **5 Claims**



Apparatus for stacking bricks and other articles comprises a series of conveyors and gripper devices for transferring individual layers from one conveyor to another. To avoid delays a dual path is provided over part of the apparatus. A table receives the layers from both paths alternately and a stack is delivered from the table to a fixed support base and thence to a take away conveyor.

3,608,747

APPARATUS FOR TRANSFERRING A BUNDLE OF PAPER FROM A PAPER PILE ON A TABLE LIFTER ONTO A TABLE

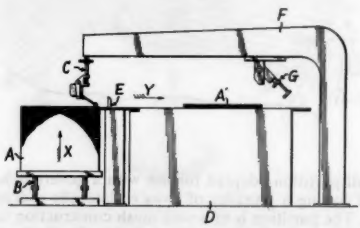
Seiya Shibata; Akitoshi Yamasaki, and Isokazu Shimono, all of Osaka, Japan, assignors to Tsubakimoto Chain Manufacturing Company, Limited, Osaka, Japan

Filed Dec. 18, 1969, Ser. No. 886,136

Claims priority, application Japan, Dec. 19, 1968, Dec. 24, 1968, 43/111282;43/95175

Int. Cl. B65g *59/02*

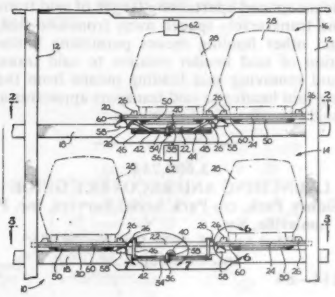
U.S. Cl. 214—8.5 A **5 Claims**



An apparatus to be used in transferring a bundle of paper from a paper pile on a table lifter or the like onto a table in the subsequent step. Upon detecting undulation in the top surface of the paper pile, a suitable number of detectors emit a signal indicating whether the paper bundle can be transferred or not to control the upward movement of the paper

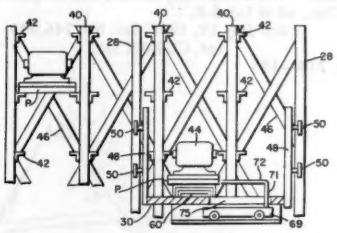
pile. Before transference, the end of the undulated paper bundle is flattened by an intermediate unit and clamped by a clamp device.

3,608,748
VEHICLE PARKING GARAGE
Paul R. Wilson, 17830 Bahama St., North Ridge, Calif.
Filed Nov. 26, 1969, Ser. No. 880,050
Int. Cl. B65g 1/06
U.S. Cl. 214—16.1 CC 7 Claims



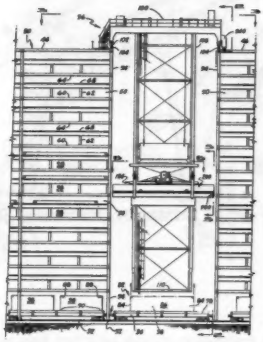
A parking garage apparatus is disclosed herein for storing vehicles which provides a plurality of parallel longitudinal lanes or sections having a multiplicity of laterally movable pallets or carriers wherein each section is capable of storing parked vehicles on the respective carriers arranged in end-to-end relationship to form parking rows. A central travelling lane for vehicles to use during parking procedures is disposed between the adjacent parking sections and includes vertically movable platforms operable between a raised position and a lowered position, each platform serving as a coextensive surface with said carriers in its raised position, while in its lower position, permitting lateral movement of selected adjacent carriers thereover. Means are included for automatically conveying vehicles intended to be parked along the travelling lane and for selectively positioning the carriers and the platforms to permit unrestricted selection of parking location.

3,608,749
PLURAL DEPTH STORAGE SYSTEM WITH A PLURALITY OF ARTICLE HANDLING MEANS
Howard A. Zollinger, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 31, 1969, Ser. No. 889,507
Int. Cl. B65g 1/06; B60p 1/44
U.S. Cl. 214—16.4 A 5 Claims



Described is a high bay storage warehousing system of the type wherein storage rack modules comprising superimposed storage racks are disposed on either side of an aisle. Articles to be stored in the racks are carried to and from a loading area at one end of the aisle by means of a stacker crane which runs on overhead rails. The loads are stored two deep on either side of the aisle, while a unique stacker crane is provided capable of reaching twice the width of a load to retrieve a load in the back of a rack. Also described is a novel method for warehousing utilizing a high bay storage system of the type described above wherein loads are stored one behind the other in each rack of a storage module.

3,608,750
STORAGE MEANS AND LOAD-HANDLING EQUIPMENT THEREFOR
Robert R. Young, Danville, and Robert W. Medland, Hayward, both of Calif., assignors to Kaiser Industries, Inc., Oakland, Calif.
Filed Mar. 3, 1969, Ser. No. 803,838
Int. Cl. B65g 1/06
U.S. Cl. 214—16.4 A 8 Claims



Equipment for transferring large heavy containers and similar loads among the compartments of a vertical array of compartments and a separate transfer station and more particularly to a crane for inserting such containers into the compartments and depositing the same therein or for picking up the containers within the compartments and removing the same therefrom.

3,608,751
DEVICE AND METHOD FOR LOADING OF VERTICAL CATALYST TUBES
Virgil A. Hundtofte, Omaha, Nebr., assignor to Allied Chemical Corporation, New York, N.Y.
Filed Mar. 6, 1970, Ser. No. 17,097
Int. Cl. B65g 65/32
U.S. Cl. 214—17 C 14 Claims

A device and method for facilitating dry loading of a particulate catalyst into vertical catalyst tubes. The loading

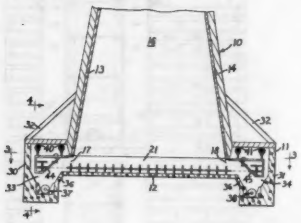
device includes an elongated member such as a Manila line having inclined blades mounted thereon at selected spaced intervals. The elongated member is held vertically in the catalyst tube during the loading of the catalyst whereupon the blades function to cushion and retard the speed of the catalyst, the elongated member being removed therefrom in timed relation to the loading. With use of the device, catalyst breakage is greatly minimized.

3,608,752

STORAGE FACILITY FOR PARTICULATE MATERIAL

John L. Peterson, and George H. Pettis, both of Spokane, Wash., assignors to Atlas Spokane, Inc.

Filed Aug. 11, 1969, Ser. No. 848,978
Int. Cl. B65g *65/42*
U.S. Cl. 214—17 DA **5 Claims**



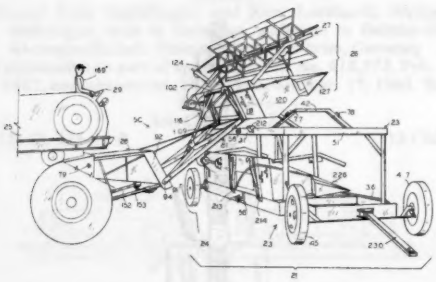
A storage facility has a rectangular cross section with sidewalls elevated above a floor providing side openings between the walls and the floor. A continuous drag line is slidably mounted on the floor between dual carriages that ride on the rails outside the sidewalls for removing the particulate from the floor to conveyors at the edges of the floor. Motors drive the continuous drag line while the carriages move on the rails to move the continuous drag line into the particulate pile.

3,608,753

COMBINE HEADER AND TRANSPORT APPARATUS

Ronald J. Scott, 211 West Cherry, Amarillo, Tex.

Filed May 23, 1969, Ser. No. 827,366
Int. Cl. B65g *67/04*
U.S. Cl. 214—38 R **1 Claim**



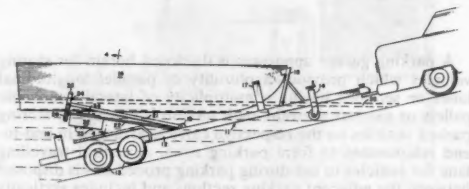
A cooperatively related transport apparatus and loading apparatus organized for rapid and reliable use of the power of a combine machine to load a plurality of headers for transport by the steps of connecting the power of a combine to a header loading means; releasably supporting the bottom wall of said header at its rear while holding to an upper portion of said header by said loading means; transmitting power from said combine to said loading means and thereby raising the thus-held header upwards, and then moving said header transversely to the length thereof and towards and over a transport apparatus therefor and centrally of means thereon for attaching said header to said transport apparatus; then moving said header downwardly and laterally and thereby engaging said transport apparatus and said header-holding means spaced apart along length of the transport apparatus whereby limited longitudinal motion of said header relative to said transport apparatus is permitted, and at two other holding means spaced apart along length of said transport apparatus and transversely spaced away from said first holding means, said other holding means permitting limited transverse motion of said header relative to said transport apparatus; and removing said loading means from the header and locking said header to said transport apparatus at a point between said two other holding means.

3,608,754

LAUNCHING AND RECOVERY GUIDE

Wallace Sidney Park, c/o Park Aerial Surveys, Inc. P. O. Box 21379, Louisville, Ky.

Filed Apr. 14, 1970, Ser. No. 28,371
Int. Cl. B60p *1/52*
U.S. Cl. 214—84 **9 Claims**



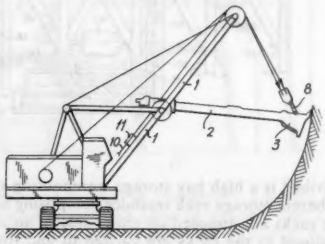
A launching and recovery guide for a boat trailer comprises a floatable concave member hingedly connected to the trailer for movement between a normally retracted position below the rear bolsters of the trailer to protracted positions above the bolsters. The concave member is adapted to contact the bottom of the hull of the boat as it is being launched from the trailer or recovered and retain it in a longitudinal position against the forces of tide, water currents and wind until the launching or recovery is completed.

3,608,755

STRAIGHT-SHOVEL-TYPE WORKING EQUIPMENT OF A SINGLE-BUCKET EXCAVATOR

Boris Ivanovich Solokhin, prospekt Lenina, 21, kv. 40, Kolpino; Vladimir Iosifovich Khazak, prospekt Dalnevostochny, 60, kv. 4, Leningrad, and Viktor Afanasievich Kartashov, ulitsa Zapadnaya, 25, kv. 2, Kolpino Leningradskoi Obl., all of U.S.S.R.

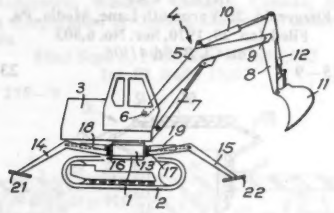
Filed July 19, 1968, Ser. No. 746,093
Int. Cl. E02f *3/62*
U.S. Cl. 214—135 **7 Claims**



A single-bucket excavator comprises a boom with a grip mounted thereon and turnable about its longitudinal axis. A

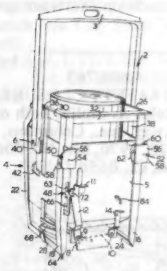
bucket is mounted on the grip and is suspended on movable pulleys of two double pulley block and tackle systems containing a balancing system which transmits loads to the boom via a spring-loaded friction device.

3,608,756
MECHANICAL EXCAVATOR OR OTHER EARTH WORKING MACHINE
Gabriel L. Guinot, Le Plessis-Belleville, France, assignor to Societe Anonyme Poclain, Le Plessis-Belleville, Oise, France
Filed June 4, 1969, Ser. No. 830,441
Claims priority, application France, June 7, 1968, 154261
Int. Cl. B66c 23/78
U.S. Cl. 214—138 **4 Claims**



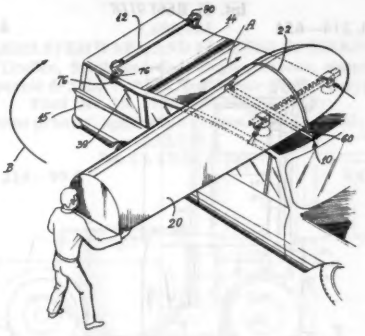
This invention consists in providing a mechanical excavator or other earth working machine having a rotary implement carrying turret with stabilizing legs mounted on a support which is rotatably mounted on the machine about an axis coaxial with the turret so that said stabilizing legs can be swung to an inoperative position fore and aft of the machine or an operative position in which they extend laterally of the machine.

3,608,757
DRUM UNLOADER
Emerick I. Tary, Vancouver, British Columbia, Canada, assignor to Laforge Canada Ltd., Vancouver, BC, Canada
Filed May 28, 1969, Ser. No. 830,583
Claims priority, application Canada, Feb. 19, 1969, 043,350
Int. Cl. B65b 69/00
U.S. Cl. 214—307 **11 Claims**



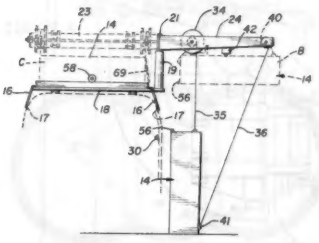
A bucket-and-bail container which is designed to be placed over an open topped drum of solid particulate materials, such as grinding balls, and, by manipulation of the bail, inverted so that the particulate materials are emptied into the bucket container. The bucket container can then be safely transported to a preselected unloading station and then emptied via a door in the bottom. After emptying the empty drum is again inverted and dumped out of the bucket container. A special feature of the invention is the provision of a safety interlock which prevents the doors in the bucket container from being opened until the bucket is positively located at the unloading station.

3,608,758
BOAT LOADING AND CARRYING DEVICE FOR VEHICLE TOP
Donald S. Dolbin, 1424 Cutright St., Chillicothe, Ill.
Filed Jan. 14, 1970, Ser. No. 2,884
Int. Cl. B60n 9/00
U.S. Cl. 214—450 **10 Claims**



A boat loading and carrying device comprises an assembly of front and rear racks attachable to the roof of a vehicle. The front rack includes a stationary rail attached transversely of the roof, and a movable rail engaged with the first rail by a pin. The pin has a key engaged in a longitudinal slot in the first rail to permit the pin and second rail to slide along the first rail when the second rail is perpendicular to the first rail. A hole at the center of the slot permits the movable rail and pin to rotate with respect to the first rail. The narrow slot engages the wider pin to prevent the pin and second rail from sliding along the first rail when the second rail is disposed parallel to the first rail. Straps attached to opposite ends of the front and rear racks hold the boat in place on the device.

3,608,759
CAR TOP CARRIER
Lawrence A. Spurgeon, Arvada, and Earl F. Sorensen, Denver, both of Colo.
Filed Dec. 24, 1969, Ser. No. 887,948
Int. Cl. B60r 9/00
U.S. Cl. 214—450 **12 Claims**



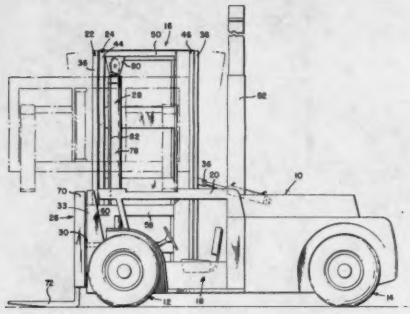
A mechanism for handling a storage compartment as it is raised from ground level to a carry position on top of a vehicle whereby wheelchairs and the like deposited in said compartment may be stored and transported for convenient useage. Controls regulate up, down, rotational and locking operations of compartment hoist elements that move the

compartment transitionally from an upright position at the side of the vehicle to an elevated flat disposition on top of the vehicle with said compartment and all hoist elements being maintained at a low elevation to preserve low clearance characteristics.

3,608,760
LIFT TRUCK WITH HORIZONTALLY SLEWABLE LOAD CARRIER

Maurice J. McIntyre, Coquitlam, New Westminister, British Columbia, Canada, and John R. Newton, Salem, Oreg., assignors to Skagit Corporation, Sedro Woolley, Wash.

Continuation-in-part of application Ser. No. 740,707, June 27, 1968, now abandoned. This application July 10, 1969, Ser. No. 840,758
Int. Cl. B66f 9/18
U.S. Cl. 214—654 **4 Claims**

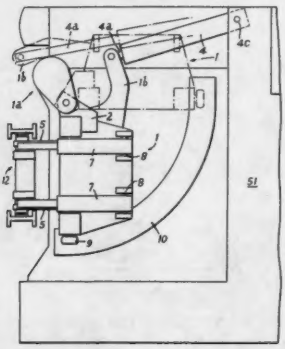


A lift truck is provided with a lift mast having a horizontal slewable load carrier. In one aspect of the lift truck the body thereof is provided with an operator's cab having a load-bearing roof onto which the load carrier can lower its load after being horizontally slewed to a laterally facing position. In another aspect of the lift truck, the fixed and movable upright guides of the lift mast are aligned longitudinally of the lift truck with the load carrier being mounted to the movable guide for vertical movement and for horizontal slewing.

3,608,761
FORKLIFT TRUCK WITH SWINGING MAST

James William Henry Taylor, New Addington, England, assignor to Matbro Limited, Horley, Surrey, England

Filed June 3, 1968, Ser. No. 734,169
Claims priority, application Great Britain, June 5, 1967, 25923/67
Int. Cl. B66f 9/20
U.S. Cl. 214—671 **1 Claim**

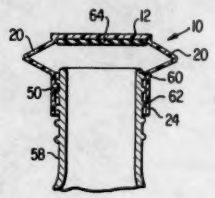


The specification describes a forklift truck having a mast structure which is mounted for swiveling about an axis offset to one side of the fore-and-aft extending center line of the truck between a forwardly facing position and a sideways facing position. The mast structure comprises a first guide which is fixed against movement in a vertical direction, a second guide which is guided for movement up and down along the first guide, a carrier frame supporting a load fork and guided for movement up and down along the second guide, and a single-extension jack for actuating the movement of the second guide and of the carrier frame. The connections between the jack and the second guide and between the second guide and the carrier frame are such that the speed of the second guide along the first guide is twice the speed of the jack and that the speed of the carrier frame along the second guide is twice the speed of the second guide along the first guide.

3,608,762
SAFETY CAP

Millard C. Fitzgerald, 25 Yarmouth Lane, Media, Pa.

Filed Jan. 29, 1970, Ser. No. 6,803
Int. Cl. B65d 41/06
U.S. Cl. 215—9 **23 Claims**

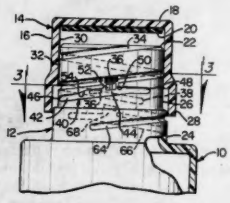


A safety bottle cap that cannot be opened by inquisitive children yet is readily openable by adults comprises a hollow member with a hollow portion large enough to encompass a screw thread disposed about a container, said hollow member comprising an upper portion separated from a lower portion by a central portion, said central portion being comprised of flexible material so that said bottom portion may be moved relative to said top portion by flexing said flexible material, said hollow member further comprising a locking member having a width less than the distance between adjacent flights of said screw thread, said locking member including a locking surface, said locking surface having a complementary shape with respect to the terminal end surface of said screw thread in order to permit said locking surface to mate with said end surface of said screw thread, said central portion having an unflexed height less than the distance between the top of said container and said terminal end surface of said screw thread to permit said locking surface to mate with the end surface of said screw thread only when said flexible central portion is in at least a partially flexed position whereby the tendency of said central portion to return to its unflexed condition exerts an upward bias on said locking member.

3,608,763
CONTAINER AND SAFETY CLOSURE THEREFOR

Mollie L. Smith, and John A. Smith, both of Lexington, Ky., assignors to Lok-A-Away, Inc., Columbus, Ohio

Filed Jan. 28, 1970, Ser. No. 006,381
Int. Cl. B65d 41/06
U.S. Cl. 215—9 **9 Claims**



Container has annular neck provided with helical guide track and closure has lug to engage guide track and advance

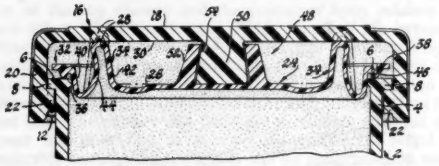
closure toward sealing position. Safety locking track axially inward of guide track is connected to guide track by axial passage. When lug reaches passageway closure is pushed axially to cause lug to move through passageway and engage locking track. Lug is rotated away from passageway to lock closure against inadvertent release. Detent in passageway requires recess in lug to pass over it. This demands very exact registry calling for knowledge of arrangement and careful manipulation. Second lug at opposite side of closure and axially spaced engages second guide track to produce balanced force and avoid rocking of seal. Second lug engages similar locking track to produce dual locking effect. Closure may be plug or cap. Lugs and tracks may be on either member. Tracks may be beads or grooves.

3,608,764

SAFETY CLOSURE ASSEMBLY

Peter Hedgewick, Windsor, Ontario, Canada, assignor to Reflex Corporation of Canada Limited, Windsor, Ontario, Canada

Filed Sept. 5, 1969, Ser. No. 855,503
Int. Cl. B65d *55/02*
U.S. Cl. 215—9 **38 Claims**



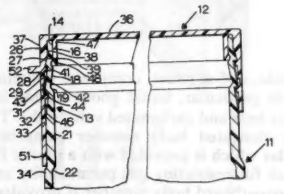
A safety closure assembly including a cap of the type which is applied to and removed from a container by a combined axial and rotative motion. A sealing member is carried by the cap and includes a base portion for overlying the opening of the mouth of a container, a portion for engaging the inner surface of the end wall of the cap, and a sealing portion for engaging the rim of a container. A resilient annular biasing member projects axially from the periphery of the base portion and extends between the cap-engaging portion and sealing portion to bias the cap-engaging portion and sealing portion to axially spaced positions such that when the cap is placed on a container, the cap is biased into locked engagement with the container and maintained in a fixed axial position relative to the container by the annular biasing member which simultaneously applies pressure to the sealing portion.

3,608,765

NECK FOR WIDEMOUTH JAR AND CAP THEREFOR

George W. Faulstich, c/o Cap Snap Seal Inc., 800 Alameda, San Carlos, Calif.

Filed Apr. 1, 1970, Ser. No. 24,708
Int. Cl. B65d *43/02*
U.S. Cl. 215—46 A **4 Claims**



A widemouth jar of plastic or glass of the type used for peanut butter has an exterior neck finish comprising two circumferential, vertically spaced buttressed beads, the lower being of greater diameter than the upper. The plastic cap which fits on the neck has a flattop disk with a peripheral skirt, the interior of which is formed with two circumferential beads dimensioned to engage immediately under the radial flanks of the beads of the neck. The wall of the skirt is weakened immediately above the lower cap bead in a circumferential internal groove which connects with a downward slanted internal groove extending to the bottom of the skirt. A finger grip tab depends from the bottom of the skirt to one side of the slanted groove.

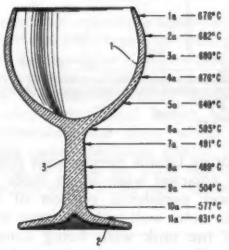
This application is an improvement upon U.S. Pat. No. 3,338,446 patented Aug. 29, 1967. However, the present invention is particularly suited to widemouth (e.g. 120 mm.) jars of plastic suitable for peanut butter and other substances which have heretofore been packed in glass jars closed with metal screw caps.

3,608,766

TEMPERED STEMWARE AND PROCESS OF MAKING IT

Rene D'Orefice, Saint-Jean-de-la-Ruelle, France, assignor to Compaznie de Saint Gobain, Neuilly-Sur-Seine, France

Filed Dec. 19, 1968, Ser. No. 785,168
Claims priority, application France, Dec. 22, 1967, 133,535
Int. Cl. C03b *27/00*
U.S. Cl. 215—99.5 **5 Claims**



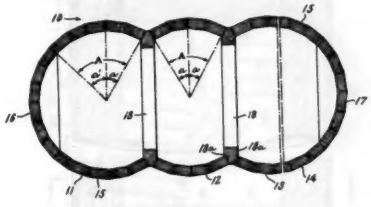
Footed glassware is, for the first time, satisfactorily tempered by annealing hollow glassware, such as goblets and blowing them with air jets. The annealing raises the surface temperature of the stemware to about 660° to 680° C. in the cup and to about 490° to 500° C. in the midlength of the stem. The new glass is of superior resistance to mechanical and thermal shocks.

3,608,767

DEEP SUBMERGENCE VESSELS OF INTERCONNECTED RADIAL-FILAMENT SPHERES

Daniel R. Elliott, Ridgewood; Edgar Francois, Wayne, and Donald C. MacDonald, Ridgewood, all of N.J., assignors to Uniroyal, Inc., New York, N.Y.

Filed June 20, 1969, Ser. No. 835,039
Int. Cl. B65d *1/16, 1/40*
U.S. Cl. 220—5 A **16 Claims**



A class of hollow, shell-type, deep submergence vessels with low weight to displacement ratio and high resistance to

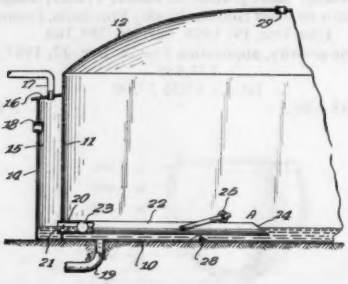
external hydrostatic pressures and made of interconnected shells in the form of equatorial segments of unidirectional radial fiber-reinforced resin spheres is disclosed. Suitable stiffening rings are provided to interconnect and take up stresses at the junctures of the sphere sections of such a vessel.

The foregoing abstract is not to be taken either as a complete exposition or as a limitation of the present invention, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be had to the following detailed description and the accompanying drawings as well as to the claims.

3,608,768
MULTIPLE-WALL LIQUID STORAGE TANK

Raymund V. McGrath, Palos Heights, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Jan. 30, 1970, Ser. No. 7,101
Int. Cl. B65d 7/22
U.S. Cl. 220—10 11 Claims

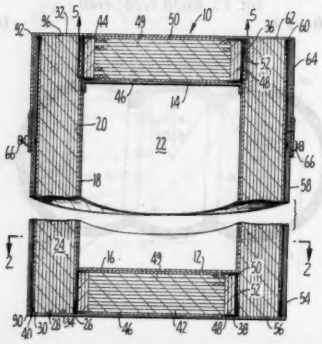


A vessel for storing liquids having walls forming an outer annular chamber adjacent walls of an inner tank and surrounding the lower peripheral portion of the tank, the chamber having an outer wall with the inner sidewall thereof and a portion of the tank walls being common, a liquid passage connecting the annular chamber and the inner tank, a pipe positioned in the inner tank communicating at its lower end with the liquid passage, and means to buoyantly support the pipe so that its upper end is below or at about the level of liquid in the inner tank to transfer liquid through the pipe between the inner tank and annular chamber when the liquid level is at or below a maximum level in the annular chamber during filling or emptying of the vessel, and to support the upper end of the pipe above the liquid level in the inner tank when the liquid level in the annular chamber reaches or is at the maximum level.

3,608,769
SHIPPING CONTAINER ARRANGEMENT

Kenneth A. Gablin, Tacoma, Wash., assignor to Nuclear Engineering Company, Inc., San Francisco, Calif.

Filed June 9, 1969, Ser. No. 831,512
Int. Cl. B65d 7/22
U.S. Cl. 220—10 15 Claims

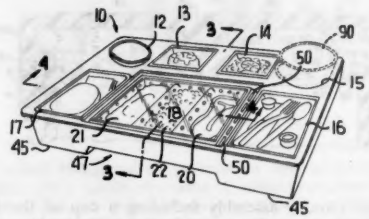


An improved hazardous materials shipping container arrangement for providing puncture and penetration resistance, flame resistance, shock absorption and thermal insulation by surrounding a standard drum with a multilayered structure to provide the various desired protections. An energy-absorbing crushable wrap is provided around the drum and extending axially longer than the drum to provide cavities at the drum ends occupied by energy-absorbing crushable plugs, an energy-reflective layer, such as aluminum foil, is wound around the outside of the energy-absorbing elements to provide thermal radiation protection. The entire assembly of the drum and the energy-absorbing wrap and the end plugs is positioned inside a lightweight outer steel drum that preferably is slightly greater in size than the energy-absorbing wrap. The outer steel drum or shell provides puncture and penetration resistance and acts as a flame barrier. The inner energy absorption core provides shock absorption and thermal insulation.

3,608,770
APPARATUS AND SYSTEM FOR FOOD PREPARATION

Vincent J. Naimoli, Wyckoff, N.J., assignor to Continental Can Company, New York, N.Y.

Filed June 10, 1969, Ser. No. 831,852
Int. Cl. B65d 25/00
U.S. Cl. 220—16 9 Claims

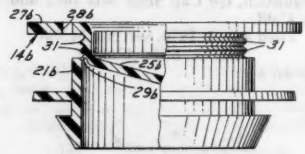


An apparatus and system for food preparation wherein a novel tray is loaded with a full course meal, transported within a novel carrier, placed into a novel oven or heating chamber, and portions of the food are heated to an elevated serving temperature while other portions of the foods are maintained at unheated serving temperatures.

3,608,771
DISPOSABLE PRESSURE CONTAINER

Carl C. Monroe, Orchard Lake, and Verner Vollquartz, Pontiac, both of Mich., assignors to Ex-Cell-O Corporation, Detroit, Mich.

Filed Mar. 12, 1969, Ser. No. 806,487
Int. Cl. B65d 17/00
U.S. Cl. 220—27 5 Claims

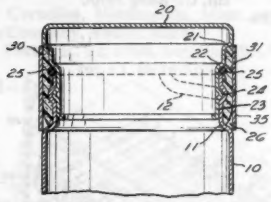


A disposable, self-destruct, composite container for liquid goods, and in particular, liquid goods having internal pressures, such as beer and carbonated soft drinks. The container includes an elongated body member comprising a paperboard cylinder which is provided with a plastic film on its internal surface for restricting gas permeability and sealing of liquid. The paperboard body member is provided with an exterior coating of thermoplastic to provide a moisture barrier, and for cosmetic appearance purposes. The paperboard body member is closed at each of the top and bottom ends thereof by a circular-shaped disc. The top disc has an opening which is enclosed by a sealing plug means that includes an integral tear-off tubular cap portion that is provided with an integrally molded pull ring for detaching the tubular cap portion.

3,608,772
BAND-SEALED CONTAINER

Richard W. Asmus, 3628 West 48th St., Cleveland, Ohio

Filed Oct. 2, 1969, Ser. No. 863,105
Int. Cl. B65d 17/24
U.S. Cl. 220—53 9 Claims



A reclosable container having a removable top closure mechanically joined to the container body to carry the structural loads of container and contents, the mechanical joint being cylindrical and connected and disconnected by rotation of the top closure and the container body relative to each other. The ultimate seal during the shelf life between filling and initial opening of the container is effected by a rupturable band adhered over the joint, said band in the locus of the joint line having a strength in shear less than its adhesive bond to the container closure and body adjacent the joint line. The closure and body are preferably recessed adjacent the joint line to receive the band. The band is preferably endless and formed in situ by application of band material in liquid condition; a repellent or adhesion inhibiter (preferably an immiscible liquid) may be located in or over the joint line to exclude entrance of the band material into the joint and provide an equatorial area of weakness for rupture of the sealing band.

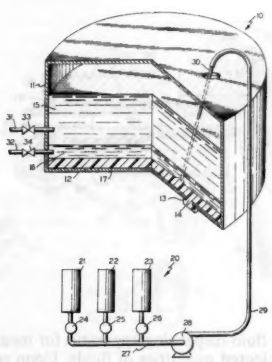
ERRATUM

For Class 220—60 see:
Patent No. 3,609,263

3,608,773
COATED TANK

Richard A. Coderre, St. Louis Park, and Robert H. Leitheiser, Jordan, both of Minn., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Apr. 29, 1968, Ser. No. 725,273
Int. Cl. B65d 25/14
U.S. Cl. 220—64 2 Claims

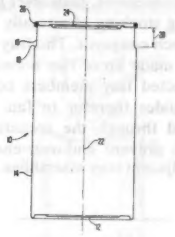


A storage tank, the bottom of which has been coated with a layer formed by polymerizing a water-in-oil emulsion without breaking same.

3,608,774
DRAWN CAN FOR ACCOMMODATING CONVENTIONAL OPENERS

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation

Filed Jan. 7, 1970, Ser. No. 1,171
Int. Cl. B65d 7/42
U.S. Cl. 220—67 3 Claims

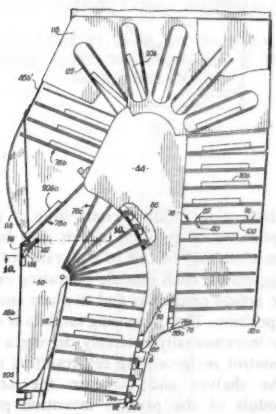


Provision is made for opening a seam-free body, two-piece can with conventional plow-type can openers while maintaining substantially the same diameter container at opposite longitudinal ends by forming an elongated necked-in portion at the open end of the seam-free body; the necked-in portion being of extended longitudinal length (approximately ½-inch) to accommodate the drive wheel of a plow-type opener; and, the radial thickness and/or placement of the chime seam being such that the outer diameter of the chime seam is substantially equal to the outer diameter of the seam-free body.

3,608,775
FIRST-IN FIRST-OUT PRODUCT-DISPENSING MACHINE HAVING HIGH-LEVEL ARTICLE DISPLAY AND DISCHARGE

Elmer Bradley Offutt, Independence, Mo., assignor to The Vendo Company, Kansas City, Mo.

Filed Oct. 9, 1969, Ser. No. 865,007
Int. Cl. G07f 11/52
U.S. Cl. 221—84 27 Claims



A first-in, first-out product-dispensing machine provided with a plurality of upright, side-by-side conveyors each hav-

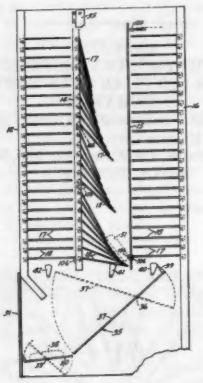
ing a series of product-supporting tray assemblies movable incrementally upon selection thereof through a respective inverted, J-shaped path of travel past a dispensing station and operable during each cycle of actuation to effect release to the dispensing station of a product supported by a tray assembly initially in a product display location proximal to the upper part of the path of travel of the tray assemblies of the selected conveyor and to also shift another tray assembly thereof into said product display position whereby both display of each of the products next to be dispensed, and delivery of a selected product to the dispensing station, may be carried out at a convenient, high-level height while at the same time permitting stocking of virtually all of the product tray assemblies of each conveyor. The tray assemblies of said conveyors are each made up of two normally back-to-back, pivotally interconnected tray members co-operable with J-shaped conveyor guides therefor to fan apart as the tray members are moved through the arcuate portions of said closed loop path to prevent end-over-end tumbling of the products between adjacent tray assemblies.

3,608,776

ARTICLE-DISPENSING MODULE

James A. Moe, 503 Carolyn Lane, White Bear Lake, Minn., and Thomas J. Ross, 1011 Euclid St., St. Paul, Minn.

Filed Nov. 14, 1969, Ser. No. 876,752
Int. Cl. G07f *11/00*
U.S. Cl. 221—90 **18 Claims**



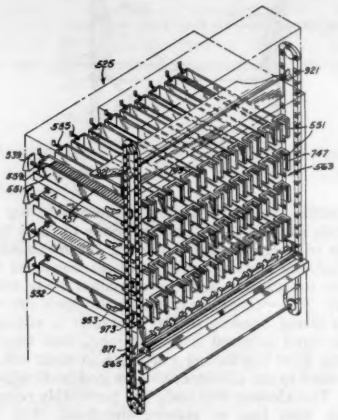
An article-dispensing module comprising a plurality of shelves in a plurality of columns which may be unloaded seriatim. The module may be one of a plurality of modules in a dispensing apparatus, each module operating on command to dispense the article on display and to place another article in the display position. The dispensing module is operated by a single motor incrementally rotatably driving a plurality of gears which control reciprocating self-resetting cams acting to release the shelves and dispense the articles. The dispensing module of the present invention provides the sequential unloading of articles from the shelves by pivoting the closely spaced shelves arranged in a plurality of columns disposed in a row and provides means for restricting the articles dispensed from becoming inverted when moving from their shelves to the display position.

3,608,777

ARTICLE-VENDING APPARATUS UTILIZING DISPLACEABLE ARTICLE-CONTAINING TRANSPORT MEMBERS

Albinus G. Bodoh, Prospect Heights; Owen J. Schwertfeger, Chicago; Roy A. Johnson, Chicago, all of Ill., and Walter E. Heller & Company, Chicago, Ill.

Filed Sept. 12, 1968, Ser. No. 759,478
Int. Cl. B65g *59/00*
U.S. Cl. 221—129 **18 Claims**



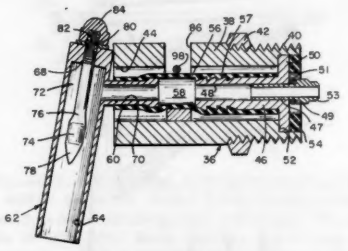
Article vending is achieved by utilizing article-containing transport members that are displaced for vending of an article thereon. The movable trays are horizontally disposed in drawers, with a plurality of vertically separated drawers positioned in a cabinet. Selection of an article located on a transport member results in that transport member being displaced to position the rearmost article on the transport member in a vend area, from whence it is conveyed to a dispensing area by a vertically movable extracting member.

3,608,778

AUTOMATIC FLUID-DISPENSING AND FOAM CONTROL APPARATUS

Archie V. Paranto, and Thomas J. Mathews, both of Dallas, Tex., assignors to Draft Meter Corporation, Dallas, Tex.

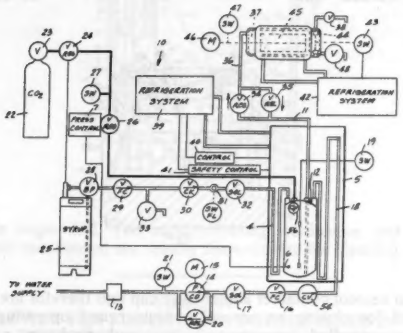
Filed Dec. 16, 1968, Ser. No. 784,070
Int. Cl. B67d *5/54*
U.S. Cl. 222—30 **9 Claims**



An automatic fluid-dispensing apparatus for measuring and dispensing preselected quantities of fluids. Upon selection of the desired dispensing quantity the apparatus is triggered and automatically fills the container with substantially the exact required amount of fluid thus substantially eliminating overpouring of the fluid to reduce loss through spillage. The quantity of fluid dispensed is accurately counted whereby an

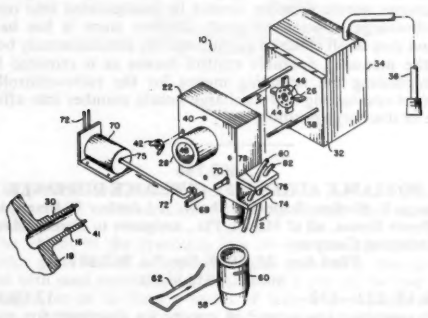
inventory of the fluid may be maintained at all times. Where the fluid is a gas-charged liquid, a foam control means is provided.

3,608,779
METHOD AND APPARATUS FOR PRODUCING AND DISPENSING A SEMIFROZEN CARBONATED BEVERAGE
Richard T. Cornelius, Minneapolis, Minn., assignor to The Cornelius Company, Anoka, Minn.
Filed Dec. 12, 1968, Ser. No. 783,302
Int. Cl. B67d *5/08*
U.S. Cl. 222—54 **15 Claims**



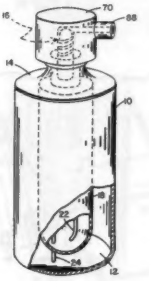
Water, syrup, and carbon dioxide gas are combined after precooling the liquids in a refrigerated carbonator, operating at a first static pressure, and thence conducted through a pressure regulator valve to a freezing chamber operating at a lower static pressure where the product is converted into a slush type of beverage under temperature and pressure conditions such that free carbon dioxide gas will be diffused throughout the product which is saturated with CO_2 gas in solution. Temperature in the carbonator is used to regulate the carbonating pressure.

3,608,780
CONSTANT-VOLUME VARIABLE-VISCOSITY MATERIAL DISPENSING APPARATUS
Foy J. Nevans, 22206 Raymond, St. Clair Shores, Mich.
Filed Oct. 2, 1969, Ser. No. 863,144
Int. Cl. B67d *5/16*
U.S. Cl. 222—73 **7 Claims**



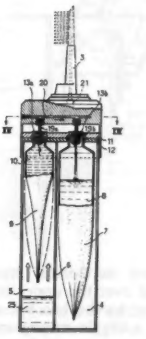
Apparatus for dispensing a constant volume of slush in a fixed time including a source of slush, a dispensing chamber having a nozzle outlet, means for positively feeding slush into the dispensing chamber from the source of slush, a selectively operable check valve within the dispensing chamber for opening and closing the nozzle outlet, an impeller in the dispensing chamber, a bypass passage in the dispenser chamber for feeding excess slush in the dispensing chamber back to the source of slush, and means for opening the check valve and rotating the impeller for a predetermined time.

3,608,781
PRESSURIZED MIXING DISPENSER
John Barry Flynn, Needham, Mass., assignor to The Gillette Company, Boston, Mass.
Filed June 7, 1968, Ser. No. 735,291
Int. Cl. B65d *35/28, 83/14*
U.S. Cl. 222—94 **13 Claims**



A pressurized mixing and dispensing device has an inner container disposed within an outer container. The dip tubes are in the inner container, one tube passing through inner container bottom to a point near the bottom of the outer container and the other going to a point near the bottom of the inner container. Both tubes are connected to outlets in the inner container, which communicate through a valve housing seated in inner container with a valve core disposed in the bore of the valve housing. The valve core has grooves in its surface in which are formed flow restricting protuberances. The core grooves are connected to the container outlets when axial force is applied to the valve core. That axial force causes the core to move axially and rotatably because of a camming pin which extends from the valve core through a camming aperture in the housing against the resistance of a spring connected between the core and the housing. A seal surrounds the valve core just below the grooves.

3,608,782
DEVICE FOR HOLDING TWO PRODUCTS SEPARATELY AND DISPENSING THEM SIMULTANEOUSLY
Robert Sathicq, Villepinte, France, assignor to L'Oreal, Paris, France
Filed Oct. 29, 1969, Ser. No. 872,034
Claims priority, application France, Nov. 5, 1968, 172,606
Int. Cl. B65d *35/24*
U.S. Cl. 222—94 **9 Claims**

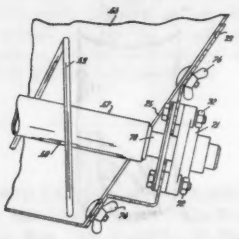


Two products are stored in separate tubes, each in a separate container compartment, with one of said tubes

under external pressure. Means are provided for connecting the tubes together so that the contents of the tube under pressure will be forced into the other tube, and for then dispensing the contents of the second tube.

3,608,783
SPREADING IMPLEMENTS HAVING A REMOVABLE FEEDER

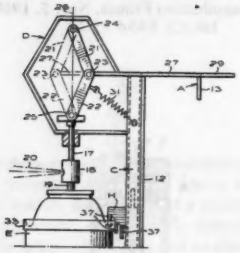
Ary van der Lely, 10, Weverskade, Maasland, Netherlands
Filed Feb. 11, 1969, Ser. No. 798,282
Claims priority, application Netherlands, Feb. 16, 1968, Nov. 21, 1968, 68,02206;68,16608
Int. Cl. B67d *5/62*
U.S. Cl. 222—142 8 Claims



An agricultural spreading implement has one or more containers for material and the container includes at least one feeder member rotatably supported in its container. The feeder member is supported at points to extend substantially lengthwise of the interior of its container and in operation, urge material towards at least an outlet opening. The feeder member is mounted for easy access and removal. A masking member can be moved relative to the bottom of the container to open or close the outlet.

3,608,784
DOOR-ACTUATED DEODORIZER

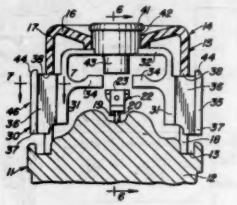
Jackson E. Brown, 198 42nd Ave., San Mateo, Calif., and Harvey G. Thomas, 1709 Berkeley Way, Berkeley, Calif.
Filed Mar. 2, 1970, Ser. No. 15,414
Int. Cl. B67d *5/12*
U.S. Cl. 222—180 7 Claims



A door-actuated deodorizer having a hanger bracket removably hooked over the upper edge of a door, and a vertical guide secured to the bracket on the inner face of the door. Moreover, a toggle arrangement is supported by the guide and a toggle actuator is disposed so that a sliding bar thereof projects outwardly beyond an outside face of the door, the bar having an outer end located to abut against a stop strip of the door frame as the door is closed, thereby causing a reciprocating plunger on the toggle arrangement to be moved so as to depress an atomizer spray head on a can of disinfectant that is supported by the guide, causing disinfectant to be sprayed into the room.

3,608,785
AEROSOL CONTAINER AND CLOSURE CAP UNIT THEREFOR

August J. Durso, 1604 Blackthorn Drive, Glenview, Ill.; Frank C. Maurer, Skokie; John F. McEnery, Niles, and George A. Panczyszyn, Glenview, Ill.
Filed Dec. 18, 1969, Ser. No. 886,264
Int. Cl. B65d *83/14*
U.S. Cl. 222—182 12 Claims



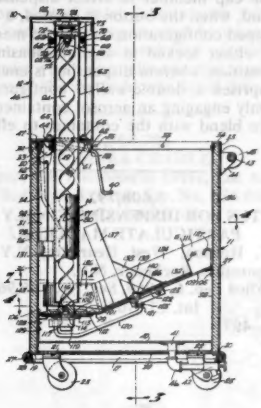
An aerosol container and closure cap unit therefor are provided for closing an aerosol container and operating the valve-controlled aerosol-conducting and discharge nozzle member of an aerosol container, and includes means for actuating the valve-controlled aerosol-conducting and discharge nozzle member and the valve means therefor; a generally cylindrical closure cap housing mounted on the top wall of the generally cylindrical body of the said aerosol container, and including a top wall and a depending generally annular sidewall; manually operable control means movably mounted in the generally cylindrical closure cap housing for moving the said actuating means into engagement with the said valve-controlled aerosol-conducting and discharge nozzle member including a first manually operable control means mounted at one point on the wall of the closure cap housing, and a second manually operable control means mounted at another point on the wall of the closure cap housing. The valve-controlled aerosol-conducting and discharge nozzle member is moved into engagement with the valve means therefor to open the latter by simultaneously manipulating both of the manually operable control means and the valve-controlled aerosol-conducting and discharge nozzle member cannot be operated without operating both of such manually operable control means simultaneously. The construction and arrangement of the closure cap unit are such that the valve-controlled aerosol-conducting and discharge nozzle member cannot be manipulated into open or discharge position by small children since it has been found that small children cannot operate simultaneously both of the manually operable control means as is required for manipulating the actuating means for the valve-controlled aerosol-conducting and discharge nozzle member into effective or discharge position.

3,608,786
PORTABLE AUGER LIFT CUBED ICE DISPENSER

George R. Shelley; Robert J. Shelly, Jr.; Arthur B. Dixon, and Bruce House, all of Miami, Fla., assignors to Shelley Manufacturing Company
Filed Aug. 25, 1969, Ser. No. 862,587
Int. Cl. G01f *11/00*
U.S. Cl. 222—232 12 Claims

A portable, low center of gravity ice dispenser for automatically dispensing predetermined portions of cubed, cracked or crushed ice is described, including an ice bin supplied with the ice to be dispensed and an ice elevating mechanism in the form of an auger having an ice feeder disc at its lower end and an auger tube within which the auger turns for elevating the ice. The auger is driven from the top

by an electrical drive means, and is mechanically connected at its lower end to agitator means for feeding ice from the bin



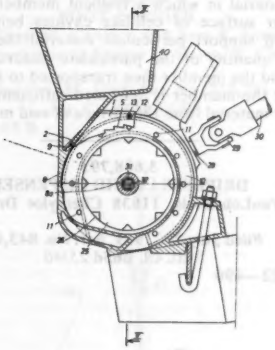
to the auger disc. The auger-elevating mechanism and the agitator mechanism are readily disassembled for cleaning.

3,608,787

DEVICE FOR ELIMINATING DOUBLE SEEDS IN DISTRIBUTORS FOR SOWING MACHINES

Xavier Roger Grataloup, Montereau, France, assignor to Societe Anonyme: Nodet-Gougis, Montereau; Paul Lamazou, Astis par Auriac (Basses Pyrenees) and Jean Lamazou, Euros (Basses Pyrenees), Morlaas, France, part interest to each

Filed June 16, 1969, Ser. No. 833,305
Claims priority, application France, July 24, 1968, 160 452
Int. Cl. G01f *11/06*
U.S. Cl. 222—342 **5 Claims**



The present invention relates to a device for eliminating double seeds or seed clusters in distributor for sowing machines.

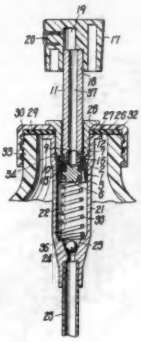
The object of the invention is a device constituted by a selector plate which is applied against the rotary disc provided with seed suction holes and which is cut out on one of its edges, so as to form a series of hollow and projecting points constituting a succession of fixed contact points situated tangentially in relation to the trajectory of the conglomerated packets or clusters of seeds near the suction holes, these fixed points having the effect of turning each conglomeration of seeds around and/or over said holes and, through their dissociative contact, effecting the elimination of all double seeds or additional seeds situated around each of the suction holes.

3,608,788

FLUID-DISPENSING PUMP

Noboru Tanaka, Fujiidera, Japan, assignor to Kabushiki Kaisha Mitani Valve, Taito-ku, Tokyo, Japan

Filed Dec. 13, 1968, Ser. No. 783,680
Claims priority, application Japan, Dec. 15, 1967, Dec. 15, 1967, Dec. 29, 1967, Sept. 28, 1968, 42/80,365;42/80,366;42/110,576;43/70,668
Int. Cl. B67d *5/40*
U.S. Cl. 222—384 **9 Claims**



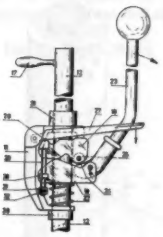
This disclosure relates to a finger-operated atomizer pump for separating a liquid from a container, and is so formed that, in case a piston is pushed down or is pushed up by a resiliency of a coiled spring when the force of pushing it down is released, a valve body may move vertically to open or close a passage hole connecting an inner chamber of a cylinder and a central hole of the piston. Therefore, there are obtained advantages that the number of the component parts is small, that therefore the trouble and wage for making many component parts can be reduced, that the trouble in assembling them can be reduced and that the products can be provided cheaply.

3,608,789

APPARATUS FOR PREPARING PUREE OR A SIMILAR PRODUCT

Willem H. Willemsen, 83, Westervalge, Warffum, Netherlands

Filed Oct. 31, 1969, Ser. No. 872,966
Claims priority, application Netherlands, Nov. 14, 1968, 68/6249
Int. Cl. G01f *11/00*
U.S. Cl. 222—391 **3 Claims**



An apparatus for preparing and extruding puree such that exactly equal portions are dispensed. The apparatus has a piston which may be operated by a lever through a displacement mechanism. The lever stroke is limited by a stop. In a preferred embodiment the stop is adjustable and also relieves the pressure on the puree at the end of the lever stroke,

thereby preventing the spilling of puree when the apparatus is inoperative as well as demixing of the puree.

3,608,790

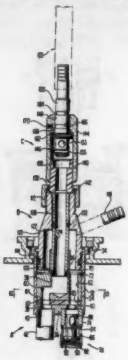
TAPPING DEVICE FOR BEER KEGS AND THE LIKE

Mack S. Johnston, Rolling Hills, Calif., assignor to Republic Corporation, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 819,706, Apr. 28, 1969. This application Dec. 31, 1969, Ser. No. 889,485

Int. Cl. B65d *83/00*

U.S. Cl. 222—400.7 **20 Claims**



Disclosed is a tapping device for beer kegs and the like including a cup-shaped keg adapter mounted in the keg opening at the brewery and a probe type coupler secured to the keg adapter at the dispensing establishment for dispensing beer. The adapter includes a pair of offset openings through its lower end wall which respectively define in part beer and gas passages through the adapter. A valve body is disposed in the adapter body and has beer and gas passageways, the body being rotatable between a position sealing about the openings and a position permitting flow of gas and beer through the valve body, respectively and into and out of the keg. The coupler includes a member engageable with the valve body to rotate the latter to the valve open and closed positions. A positive gas check valve is also provided in the keg adapter body. A beer shutoff valve is provided on the coupler.

3,608,791

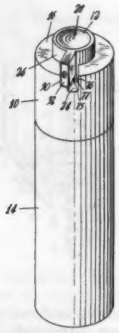
AEROSOL ACTUATOR ASSEMBLY

Gilbert S. Jordan, Monroe, and Paul H. Mohr, Chappaqua, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 15, 1968, Ser. No. 767,714

Int. Cl. B65d *83/14*

U.S. Cl. 222—402.11 **4 Claims**



An aerosol actuator assembly is provided which is functionally improved, aesthetically superior and capable of manufacture at a cost which is economically competitive. The actuator comprises a cap member and an actuator button concentrically mounted therein. The button moves axially within the cap member to effect dispensing of aerosol formulation and, when the button is rotated, a spout thereon engages a stepped configuration on the cap member whereby the button is either locked in a nondispensing position or moved to a position wherein dispensing is enabled. The cap member comprises a double-walled configuration with an inner wall firmly engaging an aerosol container and an outer wall shaped to blend with the container to effect a streamlined contour.

3,608,792

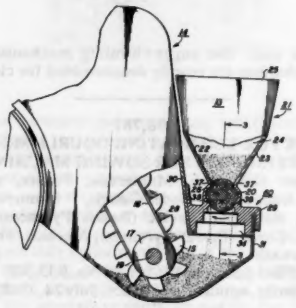
APPARATUS FOR DISPENSING FINELY DIVIDED PARTICULATE MATERIAL

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Feb. 6, 1969, Ser. No. 796,965

Int. Cl. G01f *11/00*

U.S. Cl. 222—407 **3 Claims**



Method and apparatus for dispensing a finely divided particulate material in which a resilient member having a textured outer surface of cell-like cavities being adapted to receive and support particulate material therein is passed through a quantity of the particulate material to load said member and the member then transported to a discharge station where the member is deformed sufficiently to force the particulate material from the surface of said member.

3,608,793

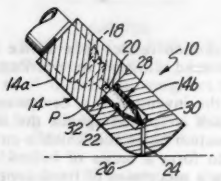
DRIPLESS LIQUID DISPENSER

Peter J. VanLobenSels, 11838 Cherrylee Drive, El Monte, Calif.

Filed July 22, 1969, Ser. No. 843,411

Int. Cl. B65d *25/40*

U.S. Cl. 222—490 **4 Claims**



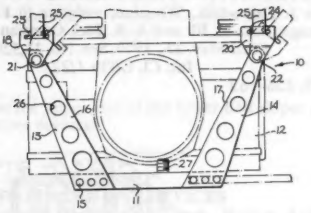
A dripless liquid dispenser having an inlet for receiving liquid at dispensing pressure and one or more dispensing ports through which the liquid exits from the dispenser. Each port is provided with an individual pressure-actuated valve

which opens to pass liquid to the port when liquid is supplied to the dispenser inlet at normal dispensing pressure and closes to block dripping of the liquid from the port when the supply of liquid to the dispenser is Shut off. The preferred dispensing port shutoff valve is an elastic valve sleeve surrounding the communicating passage between the port and dispenser inlet and having an exit end located immediately adjacent the port which normally assumes a constricted configuration wherein the sleeve blocks liquid flow to the port.

3,608,794
CAMERA CRADLE

Harry E. Mazur, 930 Westbourne Drive, Los Angeles, Calif.

Filed Sept. 8, 1969, Ser. No. 856,081
Int. Cl. A45f *5/00*
U.S. Cl. 224—5 V **10 Claims**

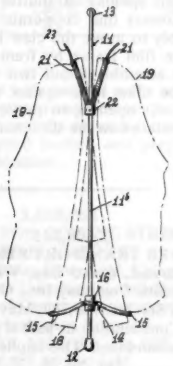


A camera cradle is disclosed herein having a flat base including fastening means for detachably securing a camera thereto for supporting purposes. A pair of spaced diverging support members are secured to one side of the base at the opposite ends thereof so as to project upwardly adjacent the camera secured to the base. The free end of each support member carries a swivel connection for coupling to a suitable neck strap whereby the cradle-supported camera may be readily positioned transversely or tilted without encountering strap binding, interference with actuating mechanisms of the camera or unstable support for the camera.

3,608,795
BOOT CARRIER

Bernard W. Klein, St. Charles, and Sam F. Emma, Geneva, both of Ill., assignors to Gunter L. Steves, St. Charles, Ill., a part interest

Filed Oct. 30, 1968, Ser. No. 771,781
Int. Cl. B65d *71/00*
U.S. Cl. 224—45 R **5 Claims**

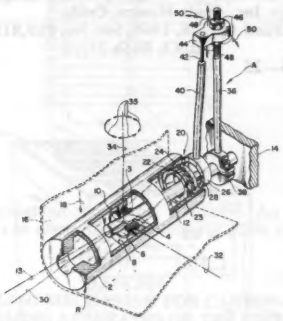


This invention is concerned with the structure of a ski boot carrier having a frame of a length greater than the boots and provided with an adjustably mounted cradle on each side at one end to receive and support the heel of a boot and a resilient strap on each side adjacent to the other end to engage over the sole at the boot toe. A carrying handle is at one end.

3,608,796
WEB-SUPPORTING DEVICE

John E. Morse, and Richard A. Marsh, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,565
Int. Cl. B65h *25/26*
U.S. Cl. 226—21 **11 Claims**

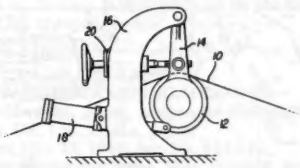


A supporting roller across which a flexible web moves is rotatably mounted at its midpoint on a longitudinal shaft and is pivotally movable with respect to said shaft. Three orthogonal axes pass through the midpoint. The first axis is the longitudinal aXis of the roller; the roller is adjustably positionable about the second axis; and the third axis is a gimbal axis about which the roller is free to rotate. In order to restrain the roller for these movements one end of the roller is provided with a roller bearing which is connected by flexures to an annulus extending around the shaft. In one embodiment the annulus is connected by a flexure arm to a lug which is longitudinally adjustable along a support post extending perpendicular from the shaft. Also, the post is adjustably positionable about the shaft so that the direction of the gimbal axis can be changed. In another embodiment a spring bracket biases the flexure member along its axis, the amount of the movement thereof being limited by a setscrew.

3,608,797
SENSING MEANS FOR CONTROLLING FELT GUIDES

Thomas Hindle, and David Dugmore Banks, both of Blackburn, England, assignors to Hindle, Son and Company Limited

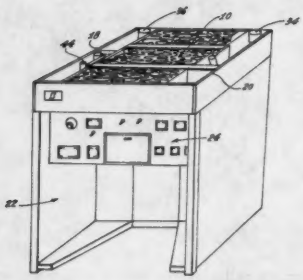
Filed Nov. 29, 1968, Ser. No. 780,086
Claims priority, application Great Britain, Nov. 30, 1967, 54464/67
Int. Cl. B65h *23/26*
U.S. Cl. 226—22 **13 Claims**



Sensing means comprising two nozzle outlets from which jets of fluid medium can issue, supported in relation to a web

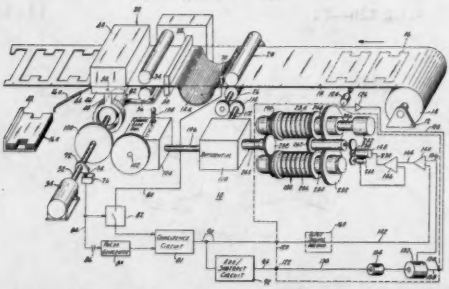
travelling over a pivotally supported guide roll which is adapted to be slewed relative to one end to correct wandering of the web by a motor and linkage connecting the motor to one end of the guide roll, said nozzle outlets being positionable in relation to the web so that when the web is moving along its normal course one or both nozzle outlets may or may not be interrupted by the web, and a detector on which the jets from the nozzle outlets fall when not interrupted by the web, said detector being operable to effect operation of the motor in a direction to effect compensating slewing of the guide roll.

3,608,798
TAPE LOOP BIN APPARATUS AND SYSTEM
William F. Lawless, Los Angeles, Calif., assignor to MCA Technology, Inc., Santa Monica, Calif.
Filed Apr. 28, 1969, Ser. No. 819,815
Int. Cl. B65h *23/18*
U.S. Cl. 226—25 **11 Claims**



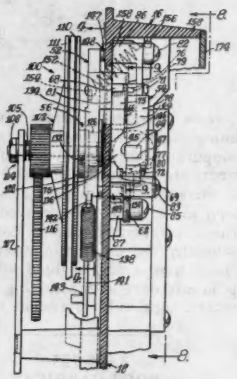
A tape loop bin storage apparatus is provided in which an endless magnetic tape, or other elongated flexible tape, is stored in serpentine folds in a bin or magazine, and which may be used in conjunction with a master recorder/reproducer. The improved loop bin storage apparatus of the invention incorporates many unique features which are of general utility in the magnetic recorder/reproducer art. For example, the apparatus includes an improved timing system which facilitates the recording of programs on the tape and the subsequent reproduction of such programs by the master recorder; and the storage apparatus further includes improved components for controlling and guiding the endless tape in and out of the storage bin.

3,608,799
PRINT TO CUT REGISTER SYSTEM
Charles R. Edson, West Allies, Wis., assignor to Zerand Corporation, New Berlin, Wis.
Filed Nov. 21, 1969, Ser. No. 878,692
Int. Cl. B65h *23/18*
U.S. Cl. 226—31 **17 Claims**



A print to cut register system for establishing and maintaining registration between a pattern on a moving web and a cutting die by controlling the operative condition of a pair of web feed rolls. The print to cut register system incorporates an electric signal means responsive to the output of a registration error detector. The electric signal means, which may include a computing resolver, provides an output signal proportional to the alteration in the web feed rolls necessary to correct the detected registration error. The electric signal means is connected to electromechanical means having a servomotor for converting the output signal of the electric signal means into a corresponding shaft speed and rotary direction signal. The servomotor shaft speed and rotary direction signal is amplified by the torque amplifier and provided through a differential drive means to the feed rolls to correct the registration error.

3,608,800
INTERMITTENT FILM-FEEDING MECHANISM
George J. Zahradnik, Wheaton, assignor to Fred S. Golden, Chicago, both of, Ill. and A. B. Dick Company, Chicago, Ill.
Filed Mar. 25, 1970, Ser. No. 22,520
Int. Cl. G03b *1/22*
U.S. Cl. 226—62 **6 Claims**

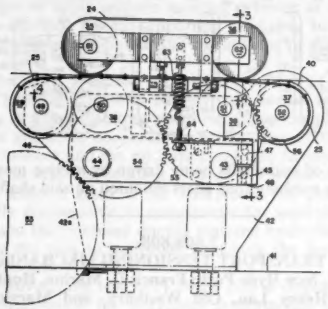


An intermittent film-feeding mechanism for advancing a motion picture film frame by frame across a film guide block has an elongated slit opening in the path of the perforations at one edge of the film for receiving a claw, and having resilient finger members engaging the opposite edges of the film to cause the perforations along said one edge of the film to pass over the slit opening. A shuttle assembly has a claw and two cam followers that cooperate with two cams of a claw drive assembly to move the claw in a closed loop path for advaNcing the film frame by frame. A spring member biases the shuttle assembly about two movable pivot members such that the claw rubs against one of the sidewalls which define the slit opening to prevent any lateral movement of the claw relative to the slit opening.

3,608,801
WEB TRANSPORT SYSTEM
Ernst Daniel Nystrand, Green Bay, Wis., assignor to Paper Converting Machine Company Inc., Green Bay, Wis.
Continuation of Ser. No. 726,788, May 6, 1968, abandoned, which is a Continuation-in-part of Ser. No. 566,609, July 20, 1966, abandoned. This application Apr. 16, 1970, Ser. No. 28,227
Int. Cl. G03b *1/30*
U.S. Cl. 226—74 **6 Claims**

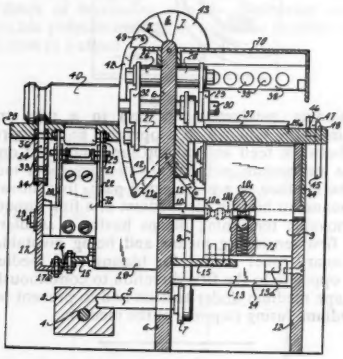
A belt system for controlling the speed of advance of line-hole-punched copy forms wherein upper and lower belts are arranged on opposite sides of the punched web, the lower

belt having pins projecting through the line holes into registering openings in the upper belt. The belts are arranged



on pulleys so that the upper run of the lower belt slopes away from the web before reversal.

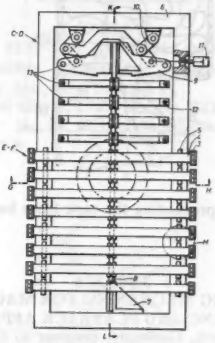
3,608,802
TWIN READ-OUT DEVICES
Heinz Pons, Walldorf, and Gunter Lorek, Hochst, both of Germany, assignors to Olympia Burosysteme GmbH, Frankfurt am Main, Germany
Filed Nov. 17, 1969, Ser. No. 877,396
Claims priority, application Germany, Nov. 16, 1968, P 18 09 335.1
Int. Cl. G11b *15/66*
U.S. Cl. 226—90 **12 Claims**



Twin readout devices with parallel paths and aligned transporting rollers for two record carriers, are provided with control means for simultaneously adjusting one device to the width of a specific record carrier, and preparing the other device for a readout operation.

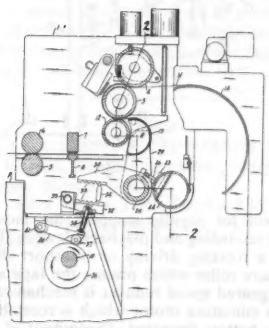
3,608,803
ROLLER TRACK FOR GUIDING STRIPS HAVING PARALLEL EDGES
Peter Herzhoff, Leverkusen; Hans Gref, Cologne-Stammheim; Wolfgang Schweicher, Leverkusen, and Karl Voss, Leverkusen-Alkenrath, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Sept. 11, 1969, Ser. No. 857,131
Int. Cl. B65h *17/28*
U.S. Cl. 226—95 **6 Claims**

A roller track for guiding flexible strips through a change in spatial direction has a series of idler rollers perpendicularly connected to an elongated deformable guide member. The guide member has a continuous deformation which causes the rollers attached to it to assume a staggered position relative to each other. A low pressure is maintained by suction under the rollers to retain the strip in close contact



with them throughout the spatial transition. An elongated spring provides an elastic type of elongated guide member.

3,608,804
WEB HANDLING MECHANISM FOR CARTON-BLANK-FORMING APPARATUS OR THE LIKE
Raymond Swansen, Jr., West Allis, Wis., assignor to Zerand Corporation, New Berlin, Wis.
Filed Mar. 5, 1970, Ser. No. 16,716
Int. Cl. B65h *17/44*
U.S. Cl. 226—114 **10 Claims**

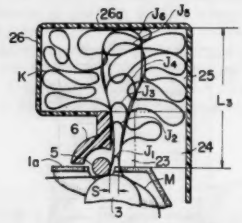


web-handling apparatus for feeding a web to a carton-forming press or the like and in which the web is continuously fed by metering rolls and after passing through the metering rolls the web is intermittently stopped prior to its entry into the press. The loop in the web which is intermittently formed between the metering rolls and the intermittent feed rolls has means movable therewith and which prevents slapping action of the loop as it is taken up by the feed rolls when the latter are engaged.

3,608,805
TAPE-FORWARDING MEANS
Osamu Ogata, Suwa-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 23, 1969, Ser. No. 827,196
Claims priority, application Japan, May 31, 1968, May 31, 1968, May 31, 1968, 43/37666; 43/37667; 43/37668
Int. Cl. B65h *17/20*
U.S. Cl. 226—118 **4 Claims**

A tape-forwarding means for making a tape contained in a case to run at a predetermined speed in a predetermined

direction during recording and/or reproducing, in which provisions are made for preventing a malfunction of tape forwarding, and for preventing the tape from being damaged or cut.

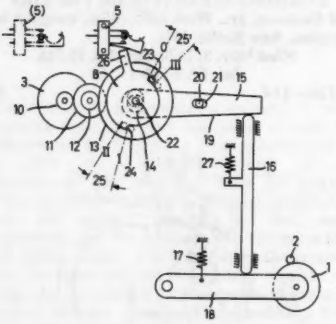


3,608,806

TAPE-STOPPING MECHANISM FOR MAGNETIC TAPE RECORDING AND PLAYBACK APPARATUS

Helge Butte, Fuerth, Germany, assignor to Grundig E.M.V., Elektro-Mechanische Versuchtsanstalt, Inh.: Max Grundig, Fuerth am Bay, Germany

Filed May 8, 1970, Ser. No. 35,722
Claims priority, application Germany, May 13, 1969, P 19 24 306.2
Int. Cl. G11b *15/24*
U.S. Cl. 226—176 **11 Claims**



An arrangement for rapidly stopping the movement of magnetic tape in recording and playback devices. The tape is driven between a rotating driving or transport shaft and a rubberized pressure roller which presses the tape against the driving shaft. A geared speed reducer is mechanically linked to the shaft of a miniature motor which is rotatable in both directions and is battery-operated. The output of the speed reducer drives an eccentric and a cam mechanism. The eccentric actuates the rubber pressure roller to move it away from the tape and the driving shaft when the movement of the tape is to be stopped. At the same time, the cam operates a switch which results in short circuiting of the motor to provide electrodynamic braking whenever the tape is to be stopped. A remote control switch in either the microphone or foot switch may be operated in conjunction with the recorder and playback apparatus.

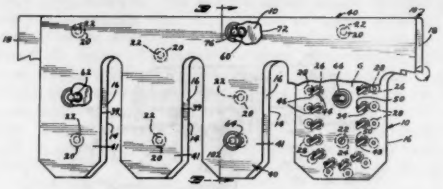
3,608,807

DRIVING MECHANISM FOR A ROLLER TRANSPORTING DEVICE

Conrad E. Lee, Mound, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed June 9, 1970, Ser. No. 44,792
Int. Cl. B65h *17/20*
U.S. Cl. 226—188 **9 Claims**

Driving means for transporting sheet material between a series of companion rollers rotatable in opposite directions and which are rotatably mounted in bearing means and rotated by cranks acting between said rollers and driving plates being each actuated by one driven crank acting between the plate and rotatably supported on parallel shafts journaled in said bearing means, and two or more floating cranks, one of said shafts being driven by motive means and the other by meshing spur gears mounted on said shafts.

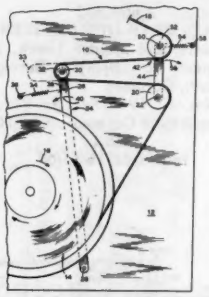


3,608,808

TAPE TRANSPORT TENSIONING MECHANISM

Edgar Wolf, New Hyde Park; Francis C. Marino, Huntington; Edward Henry Lau, Old Westbury, and Marvin Laut, Huntington Station, all of N.Y., assignors to Digitronics Corporation, Albertson, N.Y.

Filed Mar. 6, 1969, Ser. No. 804,907
Int. Cl. B65h *23/10*
U.S. Cl. 226—195 **8 Claims**



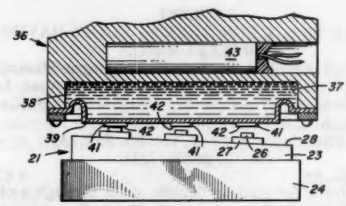
A tensioning mechanism for use in a tape transport mechanism of the type which is operable to transport a tape medium between feed and takeup reels mounted on a tape deck. The mechanism includes a stationary roller means for guiding the medium in a preselected path, first movable tensioning means for biasing the medium in a first direction and second movable tensioning means having a smaller inertia than the first tensioning means and being pivotable about said stationary roller means for biasing said medium in a direction opposite to the first direction to continuously maintain the tape medium under tension and to prevent breakage of the medium during stepping of the medium.

3,608,809

APPARATUS FOR UNIFORM MULTIPLE-LEAD BONDING

Robert Holbrook Cushman, Princeton, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Aug. 16, 1968, Ser. No. 753,230
Int. Cl. B23k *19/00*
U.S. Cl. 228—44 **15 Claims**



A viscous medium such as a heavy grease or molten solder is sealed in a chamber by a diaphragm to provide a compen-

sating bonding tip and/or a compensating base. As bonding pressure is applied to a workpiece to bond a plurality of leads to selected bonding sites on the workpiece, the diaphragm flexes to compensate for workpiece irregularities and the viscous medium distributes the bonding pressure across the diaphragm to apply uniform bonding pressure at each bonding site. Bonding and/or supporting pads may be carried by the diaphragm to facilitate the application of pressure to a desired site.

Alternatively, a ductile material is confined in a chamber and an apertured plate is employed to locate and retain a plurality of pins at desired positions on the ductile material. The pins and plate cooperate to confine the ductile material to the chamber and the pins are employed to apply bonding pressure to selected bonding sites on a workpiece and/or to support selected areas of the workpiece. The pins are independently displaceable to compensate for workpiece irregularities and the confined ductile material hydraulically interconnects the pins to uniformly distribute the bonding pressure to the pins.

Alternatively, the resiliency of the pins is employed to provide compensation for workpiece irregularities or the pins are mounted on a resilient mat to provide such compensation.

3,608,810

METHODS OF TREATING ATMOSPHERIC CONDITIONS

Eugene K. Kooser, Houston, Tex., assignor to World Weather Inc., Houston, Tex.

Filed Dec. 5, 1968, Ser. No. 781,623
Int. Cl. A01g *15/00*
U.S. Cl. 239—2 R **9 Claims**

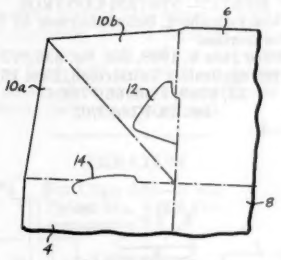
Methods of treating atmospheric conditions including dispensing in the atmosphere surfactants, water-soluble polyelectrolytes or mixtures thereof, methods of dispersing fog by dispensing fog-coalescent materials around an unstable spot in the fog and by dispensing fog-coalescent materials in a substantially straight path through an area to be cleared, and methods of increasing rain by dispensing surfactants, water-soluble polyelectrolytes or mixtures thereof around an unstable spot in a cloud.

3,608,811

CARTON BLANK

Thomas Peter Frick, Raa, Sweden, assignor to Karl Axel Arne Torbjorn Ericson, Malmo, Sweden

Filed Sept. 6, 1968, Ser. No. 757,979
Int. Cl. B65d *5/24, 5/26*
U.S. Cl. 229—31 R **6 Claims**



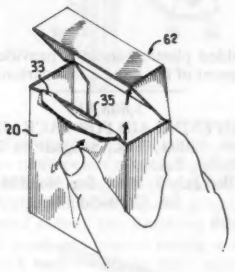
The invention is for a blank for a carton. The blank has score or fold lines so that the blank may be folded into a bottom panel, wall panel and a corner panel. Then, one of the wall panels is so cut as to project into the corner panel to form a locking tab. This locking tab is integral with the adjacent wall panel. In the other wall panel, adjacent to the same corner panel, there is a locking slit which is both in the corner panel and said wall panel. Upon folding the carton blank, the locking tab slips into the locking slit so as to lock the wall panels in a substantially normal position with respect to the bottom panel to form a carton for holding objects such as bakery good, meat and the like.

3,608,812

FLIP-TOP CARTON LOCK

Randall C. Hamilton, Elkhart, Ind., assignor to Continental Can Company, Inc., New York, N.Y.

Filed May 5, 1969, Ser. No. 821,796
Int. Cl. B65d *5/08, 45/00*
U.S. Cl. 229—37 R **5 Claims**



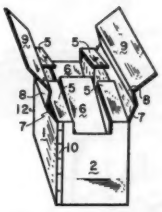
This disclosure relates to a lock for a flip-top carton. The lock comprises a flap hingedly connected to a panel of the carton body and tab means associated with the flip-top adapted to cooperate with the flap for releasably locking the flip-top in a closed condition. A slit is provided in the fold line along which the flap is hinged to the body panel whereby bending of the body panel will cause the flap to flex thereby disengaging the tabs and releasing the lock.

3,608,813

SHIPPING CONTAINER

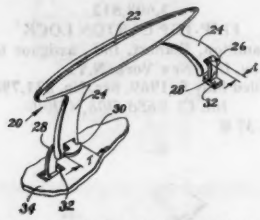
Robert O. Blasdell, Birmingham, Mich., assignor to The Mead Corporation, Dayton, Ohio

Filed Sept. 4, 1969, Ser. No. 855,307
Int. Cl. B65d *5/08, 5/50*
U.S. Cl. 229—37 E **2 Claims**



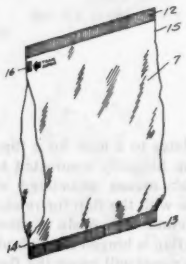
A shipping container having end panels with matching medial recesses along their lower margins. A series of flaps and panels depending from the side and bottom panels fold conformably into these recesses to define a longitudinal channel for entry of a forklift or the like. A flat-bottom interior may be provided either by a fiber board recess cover or by filler pads inserted into the container legs.

3,608,814
CARTON HANDLE
Leon Lautin, 43 White Drive North, Cedarhurst, N.Y.
Filed Apr. 25, 1969, Ser. No. 819,233
Int. Cl. B65d 5/46
U.S. Cl. 229—52 A 1 Claim



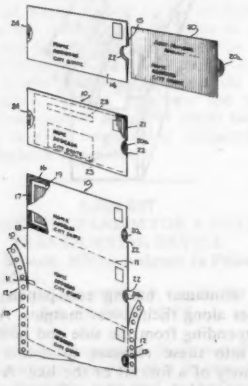
A rigid, molded plastic handle is provided with tabs permitting attachment of the handle to a carton.

3,608,815
OPENING AID FOR PACKAGES
Elmo L. Bunch, Dallas, Tex., assignor to Dixie Wax Paper Company, Dallas, Tex.
Filed July 3, 1969, Ser. No. 838,808
Int. Cl. B65d 33/00
U.S. Cl. 229—66 10 Claims



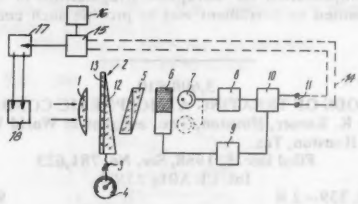
Opening aids are provided in packaging material consisting of or including at least one oriented material by minutely expanding said material in a plurality of points within an area pattern located at a position on the material which will be on a fold of the material when formed into a package.

3,608,816
SEALED ENVELOPE WITH REMOVABLE INSERT
Frank H. Neubauer, Larchmont, N.Y., assignor to Transkrit Corporation, New York, N.Y.
Filed June 20, 1969, Ser. No. 835,197
Int. Cl. B65d 27/10, 27/36
U.S. Cl. 229—69 23 Claims



A continuous series of envelopes with detachable edge strips for feeding the envelopes through processing equipment wherein each envelope and an insert contained therein may be printed. Each envelope contains a permanent adhesive along three edges to seal the front and back portions and form a pocket wherein the insert is housed. The front and back portions are bonded along the remaining edge by a releasable adhesive so that as a portion of the insert adjacent to the remaining edge is pulled away from the envelope, the bond of the releasable adhesive is broken and the insert is removed from the envelope in a one-step operation.

3,608,817
METHOD OF CONTROLLING COLOR OF AN OBJECT BY ITS RADIATION AND DEVICE FOR ACCOMPLISHING THE SAME
Dary Yakovlevich Svet, ulitsa Fersmana 3, kv. 17, Moscow, U.S.S.R.
Filed Dec. 9, 1968, Ser. No. 782,227
Int. Cl. G05d 23/27
U.S. Cl. 236—78 3 Claims

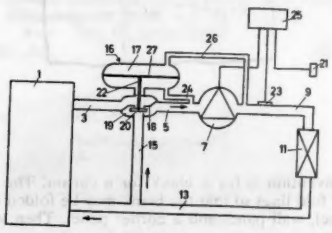


A method for controlling color temperature of an object by its radiation from which at least two radiation fluxes of different spectral compositions are separated and thereafter transformed in a device including a flux ratio setter disposed in front of or ahead of a radiation receiver, a modulator and a limiting amplifier, the transformation of the fluxes or corresponding signals being effected so as to equalize them when the object under examination acquires a temperature to be maintained constant, while temperature deviation from the preset value results in an unbalance signal which is fed to a heater of the object in order to nullify the unbalance of the aforesaid radiation fluxes.

ERRATUM

For Class 236—151.1 see:
Patent No. 3,609,315

3,608,818
HEATING SYSTEM CONTROL
Jost Eduard Von Fellenberg, Bahnkobstrasse 49 9320, Arbon, Thurgau, Switzerland
Filed June 6, 1969, Ser. No. 830,993
Claims priority, application Switzerland, June 15, 1968, May 22, 1969, 8906/68;7785/69
Int. Cl. F24d 3/02
U.S. Cl. 237—8 6 Claims



A variable-speed pump is provided in a liquid feed line between a boiler and a heat exchanger, while a bypass line extends from a return line between the heat exchanger and boiler to a three-way valve in the feed line upstream from the

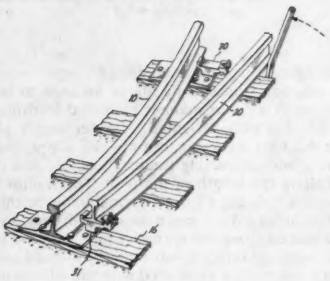
pump. The pump speed is varied as a function of temperature changes and liquid pressure variations in the feed line under varying pump speeds actuate a control for the three-way valve. In a modified embodiment the pump speed is constant and liquid pressure variations in the feed line are produced by a temperature-responsive throttle valve.

3,608,819

MUD RAIL SUPPORT ASSEMBLY

Lutillus L. S. Nelson, and Minoru Suyama, both of Seattle, Wash., assignors to Nelson Iron Works, Seattle, Wash.

Filed Apr. 28, 1969, Ser. No. 819,686
Int. Cl. E01b 5/18
U.S. Cl. 238—20 2 Claims



A support assembly is disclosed for holding a mud rail in predetermined spatial relationship to a main running rail, the apparatus finding a particular use at railroad crossings. The mud rail support, commonly called a mud rail chair, includes a main support base which is welded to a conventional rail tie plate with the base being welded on the tie plate at a position such that the mud rail will be spaced the desired distance from the main running rail. The support assembly includes an outer flange receptacle having an opening adapted to receive one edge of the flange of the mud rail and includes a portion which partly covers the upper edge of the flange. A locking plate arm extends laterally from the support base at a position opposite the flange receptacle and includes a substantially vertical edge adapted to engage the outer flange of the mud rail. The small vertical edge serves to hold the mud rail in position temporarily with a locking plate then being secured to the arm via a bolt and nut assembly so that the mud rail is then firmly held in position on the mud rail chair. Construction details of the support assembly and a preferred method of utilizing the same are disclosed.

ERRATUM

For Class 239—2 see:
Patent No. 3,608,810

3,608,820

TREATMENT OF ATMOSPHERIC CONDITIONS BY INTERMITTENT DISPENSING OF MATERIALS THEREIN

Eugene K. Kooser, 1510 Ronson Drive, Houston, Tex.

Filed Dec. 5, 1968, Ser. No. 781,624
Int. Cl. A01g 15/00
U.S. Cl. 239—2 R 7 Claims

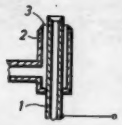
Methods of treating atmospheric conditions including intermittently dispensing unbalancing materials such as salts, surfactants, water soluble polyelectrolytes or mixtures thereof in the atmosphere and methods of dispersing fog including dispensing materials that cause coalescence of water droplets in spaced locations throughout a fog.

3,608,821

ELECTROSTATIC ATOMIZATION OF LIQUIDS

Walter Simm, and Otto Koch, both of Leverkusen, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 9, 1966, Ser. No. 571,243
Claims priority, application Germany, Oct. 15, 1965, A 50511
Int. Cl. G03g 13/16; B05b 5/02
U.S. Cl. 239—3 1 Claim



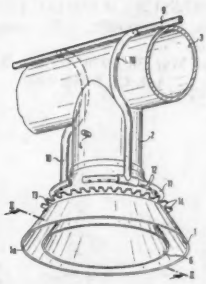
The process of atomizing liquids having conductivity in 10^{16} to 10^{13} ohms - centimeters range using either a negative or a positive electrostatic charge for the purpose of producing the aerosol which is deposited. In this process an ambient atmosphere is placed around the atomizing electrodes of an electric field with gases and vapors having a higher breakdown that air which vapors include short chained aliphatic compounds containing halogens and inorganic halogens. As a result, both negative and positive charges can be used in atomizing with liquids in the indicated conductivity range.

3,608,822

PROCESS AND DEVICE FOR THE MECHANICAL SPRAYING OF LIQUIDS

Francis David Berthoud, Vaud, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed July 9, 1969, Ser. No. 840,157
Claims priority, application Switzerland, July 12, 1968, 10481/68
Int. Cl. B05b 7/06
U.S. Cl. 239—8 11 Claims



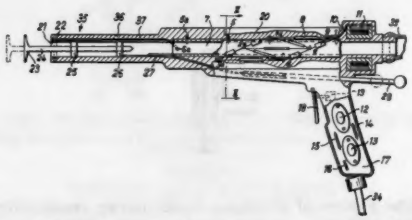
A process and device for the mechanical formation of aerosols are disclosed, whereby the formation of a downwardly flowing liquid film is effected on the slanted surface of a downwardly widening mouthpiece of an air supply line, which mouthpiece points downwards and the breakup of the film at an annular edge of the mouthpiece by an airstream which escapes under slight excess pressure from the interior of the at least approximately cone-shaped hollow space inside the mouthpiece, whereby the film is atomized in the form of an essentially vertically downwardly directed spray cone. A limiting body may be inserted in the mouthpiece to direct the airstream essentially entirely toward the interrupting edge of the mouthpiece.

3,608,823

APPARATUS FOR THE ELECTROSTATIC COATING OF OBJECTS WITH ATOMIZED SOLIDS PARTICLES

Karl Buschor, St. Gall, Switzerland, assignor to Gema AG Apparatebau, St. Gall, Switzerland

Filed June 24, 1970, Ser. No. 49,354
Claims priority, application Switzerland, June 25, 1969, 9744/69
Int. Cl. B05b 5/02
U.S. Cl. 239—15 21 Claims



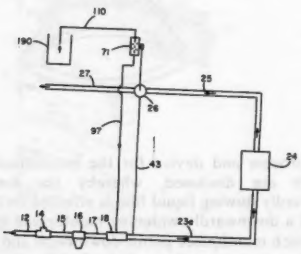
A spray gun for electrostatic coating of objects with atomized solid particles comprises a tube of electrically insulating material, the free end of the tube supporting an atomizer for the coating material and the other end being connected to conveying means for supplying coating material by means of a propellant gas stream. A high-voltage generator and electrodes are provided for the electric charging of the coating material and for maintaining a high-voltage field between the gun and the object to be coated. A plurality of electrodes are disposed on the internal wall of said electrically insulating tube and are connected to potentials of different amplitudes for producing corona discharge within the tube. The electrodes preferably are formed as spikes of tungsten successively projecting from the internal wall of the tube in the direction of flow of the propellent gas-coating material mixture, each electrode being connected to one stage of a voltage divider or voltage multiplier circuit so that the successive electrodes have an increasing potential relative to a reference potential.

3,608,824

HIGH-PRESSURE WASHING EQUIPMENT

Milton L. Ballou, Gloversville, N.Y., assignor to Lennawill, Inc., Gloversville, N.Y.

Filed Mar. 30, 1970, Ser. No. 23,656
Int. Cl. B05b 9/00
U.S. Cl. 239—124 3 Claims



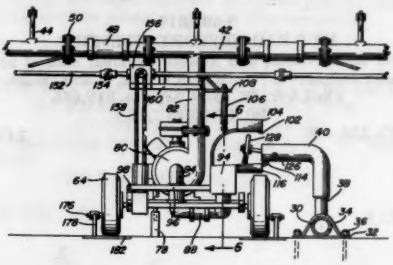
High-pressure washing equipment adapted to deliver either of two cleaning fluids selectively against hard surfaces to be cleaned and having for its principal object to provide simplified controls adapted to be selectively operated to deliver a multiplicity of cleaning fluids in the form of a high-pressure and high-velocity spray, said equipment incorporating a sequential valve.

3,608,825

LINEAR IRRIGATION SYSTEM WITH WATER TANK

Richard F. Reinke, P. O. Box 272, Deshler, Nebr.

Filed Aug. 14, 1969, Ser. No. 850,177
Int. Cl. B05b 9/00
U.S. Cl. 239—148 11 Claims



An elongated sprinkler-equipped pipe supported in elevated position transversely above an area to be irrigated and movable in a linear manner back and forth between the ends of the area to be irrigated. A water supply pipe is provided for discharging water into a water supply tank carried by a driving and supporting tractor assembly at a plurality of intervals along the length of the pipe. The tractor includes a pump mounted thereon for supplying water to the sprinkler pipe and includes a drive mechanism for driving a plurality of carriages spaced along the sprinkler pipe with the tractor and carriages being retained in substantially aligned condition by timing cam assemblies associated with the wheels on the tractor and carriages.

3,608,826

ELECTRICALLY DRIVEN CIRCULAR IRRIGATION SYSTEM

Richard F. Reinke, P.O. Box 272, Deshler, Nebr.

Filed Jan. 17, 1969, Ser. No. 792,013
Int. Cl. B05b 3/12
U.S. Cl. 239—177 18 Claims

An elongated boom having a plurality of sprinkler heads mounted thereon with the boom being constructed of a plurality of articulately connected sections supported by electrically driven wheeled assemblies for propelling the boom in a circular path about a central standpipe. The boom is in the form of a truss construction, the articulate connections between the sections of the pipe are disposed interiorly of the flow path and the sections of the boom are retained in alignment in either direction of movement. An end gun is provided and cam operated to irrigate the normally missed corners of a square area and the lugged wheels on the supporting assemblies are timed so that the lugs track thereby providing less disturbance of the ground surface.

3,608,827

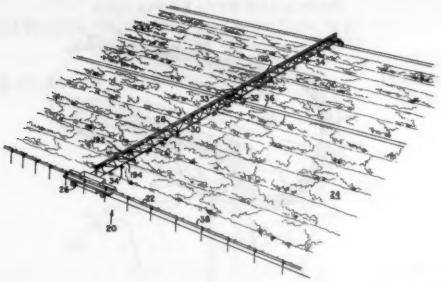
LINEARLY MOVABLE IRRIGATION SYSTEM

Alan Kinkead, Los Altos Hills, Calif., assignor to W. R. Ames Company, Milpitas, Calif.

Filed July 10, 1969, Ser. No. 840,751
Int. Cl. B05b 3/18
U.S. Cl. 239—184 8 Claims

Apparatus for irrigating a field from a stationary supply pipe on the field supplied at one end with water under pressure and having a series of valves located at predetermined spaced-apart intervals along its length. Each valve is operable by an actuating means for releasing water from the supply pipe in an open position and for preventing the release of

water in a closed position. A mobile, self-powered main drive unit movable in a direction generally parallel to the supply pipe has an open receiving tank with an outlet connected to a distribution pipe that extends generally perpendicular to said supply pipe and has a series of outlets spaced apart along its length. Means are provided on said main drive unit for opening said valves when they are positioned over the tank of said drive unit as it moves along and thereafter for closing each open valve just before the tank moves away from the open valve, thereby maintaining the tank in a filled condition as the apparatus moves along with the water being pumped through and sprayed from the distribution pipe in a predetermined manner.



3,608,828

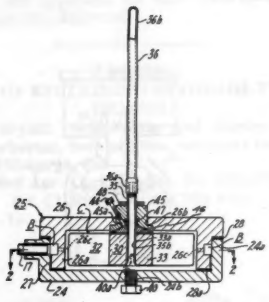
FLUID SPRAY APPLICATOR

Gerald Tokar, 3231 Pinehurst Ave, Pittsburgh, Pa.

Filed Mar. 25, 1969, Ser. No. 810,224

Int. Cl. B05b *3/04*

U.S. Cl. 239—240 **13 Claims**



A spray applicator is provided having a housing body within which rustproofing material, such as paint, an asphalt mixture, etc., is introduced under pressure as a liquid and is moved under centrifugal force to cause rotation of an impeller carried within an operating chamber of the housing and to cause a corresponding rotation of a coaxial, forwardly projecting spray nozzle wand. The wand is inserted through a drilled hole or other opening into a hidden area of a vehicle body for applying the liquid to its surfaces. Radial blades of the impeller having a spaced relation within an enclosing wall of the chamber, and a pair of opposite blades may have a closer spaced relation than others for varying the speed of rotation and the liquid spray.

3,608,829

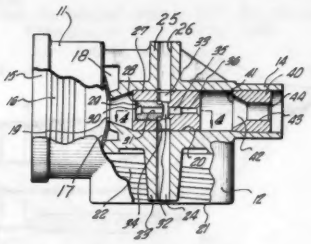
MIXING APPARATUS

Fredolph M. Forsman, Altadena, Calif., assignor to The Leisure Group, Inc., Los Angeles, Calif.

Filed Mar. 28, 1969, Ser. No. 811,311

Int. Cl. B05b *7/30*

U.S. Cl. 239—318 **5 Claims**



The invention disclosed herein describes a mixing apparatus for mixing a second liquid with a first liquid. The mixing apparatus includes a housing having a bushing located therein, the bushing functioning as an eductor means for entraining the second liquid into the first liquid. A pair of axial grooves are defined on the outer surface of the bushing to permit a portion of the first liquid to be bypassed past the eductor means.

3,608,830

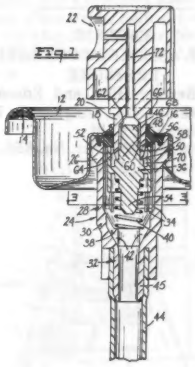
SPRAY HEAD AND VALVE FOR PRESSURIZED CONTAINER

Mario A. Ramella, Via Carlo Porto 1, Milan, Italy

Filed July 15, 1969, Ser. No. 841,726

Int. Cl. B05b *1/30*

U.S. Cl. 239—350 **15 Claims**

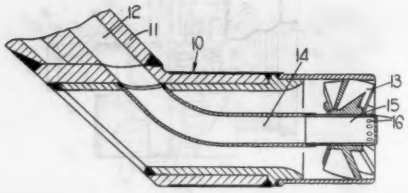


A valve and spray head to be used with a pressurized container for dispensing metered amounts of fluids, comprising a valve seat mounted at the opening of the container. Adjacent the valve seat, a tubular support member is positioned in which a plug member is spring biased to abut and seal the valve seat. Spray head means having a tubular stem is positioned about the plug member for spraying fluid. The stem of the spray head has a nozzle opening for metering the passage of fluid through the head.

3,608,831
LIQUID ATOMIZING DEVICES

Harold Place, Accrington, and Alan G. Cheshire, Burnley, both of England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed July 8, 1969, Ser. No. 839,902
Claims priority, application Great Britain, July 18, 1968, 34308/68
Int. Cl. B05b 7/10
U.S. Cl. 239—406 8 Claims

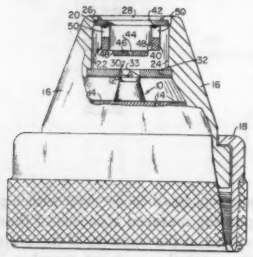


The invention relates to liquid atomizing devices, particularly intended for use in the burners of gas turbine engines. Such a device comprises a tubular body, through which, in use, air flows to a swirler formed by vanes at the downstream end of the body. The body is mounted on a support which contains a fluid passage communicating with a similar passage within the body. The fluid passage within the body is defined by a tubular member within the body and the passage may lie either within this member or between the member and the body wall. The fluid passage within the body terminates in an end wall within which, or adjacent to which, are a plurality of holes through which fluid is ejected downstream of the swirler and in a direction generally transverse to the airflow. The transverse direction of fluid ejection is achieved either by the directions of the holes themselves or by directing the fluid against a projection of the end wall or of the body. The tubular member may form part of the body or may conveniently be in the form of a cast insert. Preferably there are the same number of holes and vanes, and each hole is adjacent the root of an associated blade at the trailing edge thereof.

3,608,832
SPRAY NOZZLE ASSEMBLY OPERABLE AT LOW PRESSURE

Nathaniel Hughes, Beverly Hills, and Edson B. Gould, III, Playa Del Rey, both of Calif., assignors to Energy Sciences, Incorporated, El Segundo, Calif.

Filed Sept. 4, 1969, Ser. No. 855,342
Int. Cl. F23d 11/16
U.S. Cl. 239—419 7 Claims

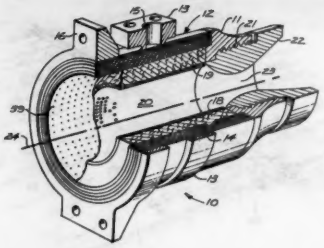


Paint sprayer with nozzle mounted in a chamber of an air cap adapted to be secured to a conventional compressed-air gun adjacent separate paint and air outlets therefrom.

3,608,833
FLUID DISTRIBUTORS AND THRUSTERS

Ronald A. Hankins, Fair Oaks; Donald W. Culver, Fair Oaks, and Harrison B. Scammon, Jr., Carmichael, all of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Oct. 13, 1969, Ser. No. 865,706
Int. Cl. B05b 1/14; F23d 13/44
U.S. Cl. 239—553.3 8 Claims

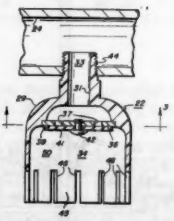


According to the present disclosure, a fluid distributor comprises a stack of a plurality of wafers. Inlet apertures are provided through inlet wafers and are in fluid communication with distribution apertures in a distribution wafer. Outlet apertures are provided in fluid communication with the distribution wafers. Preferably, metering apertures and transfer apertures are provided in serial fluid communication with said distribution apertures between the inlet and outlet apertures. A thruster according to this disclosure may include a first fluid distributor for radially injecting monopropellant into a radial catalyst pack, or a second fluid distributor for axially injecting monopropellant into an axial catalyst pack.

3,608,834
GAS DIFFUSER

David S. MacLaren, 21176 Brantley Raod, Shaker Heights, Ohio

Filed Aug. 30, 1968, Ser. No. 756,500
Int. Cl. B05b 1/30
U.S. Cl. 239—571 1 Claim



An air diffuser for use in a sewage treatment tank in combination with an air supply conduit. The air diffuser comprises a body member with an opening therein extending therethrough from an inlet side to an exit side. Valve means are located in the opening intermediate the inlet and exit sides and is movable between open and closed positions. The body member is provided with means for attaching the same to the air supply conduit in gas-conducting relationship therewith in such a position that the exit side of the body member may be located vertically below or above the inlet side. Introduction of pressurized air to the air supply conduit and to the inlet side of the body member causes the valve means to open with subsequent passage of air to the exit side of the body member and the exit side of the body member is preferably formed into a chamber of a substantially larger volume than the inlet side. A plurality of notches or slots or holes is provided in the peripheral edge on the exit side of the opening and this tends to let the air escape into the

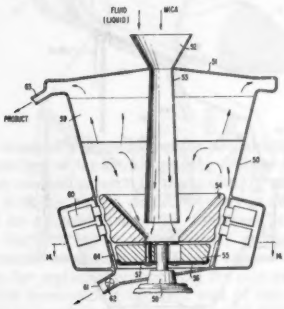
sewage in small bubbles. When the pressurized air is shut off, the gas trapped between the slots and the valve means tends to hold the valve means closed and this trapped volume of air also keeps liquid sewage from traveling back to the valve means and to the air supply conduit.

3,608,835

ULTRADISINTEGRATION AND AGGLOMERATION OF MINERALS SUCH AS MICA, PRODUCTS THEREFROM AND APPARATUS THEREFOR

Josef Ruzicka, 55-25 98th Place, Rego Park, N.Y.

Filed June 30, 1967, Ser. No. 650,543
Int. Cl. B02c *19/06*
U.S. Cl. 241—4 **11 Claims**



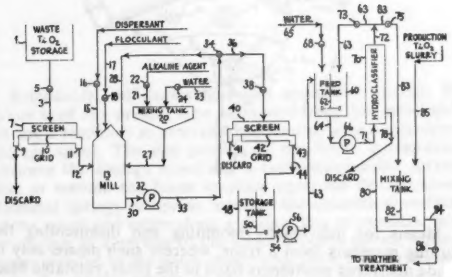
Frangible or cleavable solids, such as mica, are disintegrated in oriented, high-velocity streams of a fluid medium so as to produce thin smooth-surfaced particles or flakes having a high specific surface area and a high ratio of length to thickness. The resulting particles or flakes are useful as agglomerants, fillers or pigments or can be agglomerated to form paperlike webs or solid discs or articles of other predetermined configurations, with or without added binder, either in self-supporting form or adhered to a substrate. Various methods and apparatus for such disintegration and agglomeration are also disclosed.

3,608,836

PROCESS OF RECLAIMING OFFGRADE TITANIUM DIOXIDE

Leonard S. Bryant, Wadsworth, and Harley D. Hickenbotham, Barberton, both of Ohio, assignors to PPG INdustries, Inc., Pittsburgh, Pa.

Filed Apr. 11, 1969, Ser. No. 815,459
Int. Cl. B02c *23/06*; C09c *1/36*
U.S. Cl. 241—16 **12 Claims**



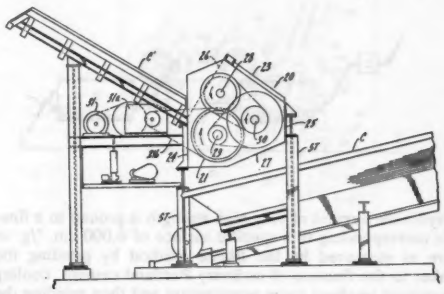
Offgrade titanium dioxide produced by vapor phase reaction of titanium halide is reclaimed to yield pigmentary titanium dioxide that can be blended with production grades of titanium dioxide pigment. Reclamation includes the steps of wet milling waste titanium dioxide under nonpeptizing conditions, and hydroclassification of the milled slurry.

3,608,837

SHREDDING MACHINE

Martin H. Panning, 304 Sunny Lane, Thienville, Wis., and Bruce R. Curry, 4731 North Oakland Ave., Whitefish Bay, both of Wis.

Division of Ser. No. 642,967, June 1, 1967, Pat. No. 3,502,276.
Filed Jan. 19, 1970, Ser. No. 3,981
Int. Cl. B02c *25/00*
U.S. Cl. 241—36 **15 Claims**



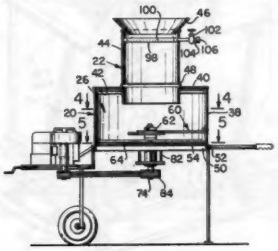
A shredding machine with shredding teeth arranged on plural axes and designed to operate with slow speed, high-torque characteristics to enable the use of relatively small horsepower motors as compared to the load which is being shredded. The machine is arranged to handle extremely large objects of complex shapes and formed from various types of materials such as are represented in automobile bodies. An automatic control circuit protects against overloads.

3,608,838

APPARATUS FOR COMMINUTING ARTICLES

Andrew P. Lundin, 323 Covington Raod, and John D. Milner, 11945 Country Club Drive, both of Los Altos, Calif.

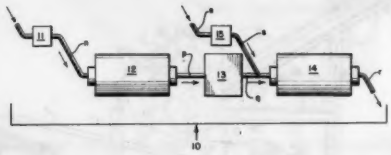
Filed May 21, 1970, Ser. No. 39,339
Int. Cl. B02c *13/18*, *13/288*
U.S. Cl. 241—55 **16 Claims**



A comminuter for reducing articles to small particles which has an upright housing with vertically spaced intake and discharge openings. A strong, rigid spider assembly comprised of a plurality of interconnected bars having tooth sides are secured to the interior of the housing between the openings. Rotatable cutting blades having sharp leading edges facing the toothed spider-blade sides are mounted below the spider assembly and include scraping members that move over the bottom of the housing and remove particles on the bottom to the discharge opening. The blades are

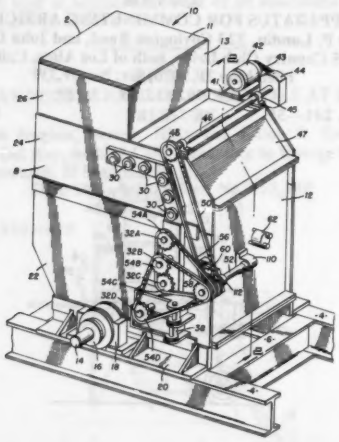
driven via V-belts by a movably mounted motor which permits the tensioning and release of the V-belts A spray pipe is mounted to the op of the housing for the introduction of water to facilitate the removal of comminuted particles into the housing interior.

3,608,839
APPARATUS FOR MAKING ULTRAFINE CEMENT
Gunnar Rindal Fagerholt, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., New York, N.Y.
Division of Ser. No. 688,732, Dec. 7, 1967, abandoned. Filed Jan. 21, 1970, Ser. No. 10,687
Claims priority, application Great Britain, Dec. 8, 1966, 55091/66
Int. Cl. B02c *17/06, 21/00*
U.S. Cl. 241—65 **2 Claims**



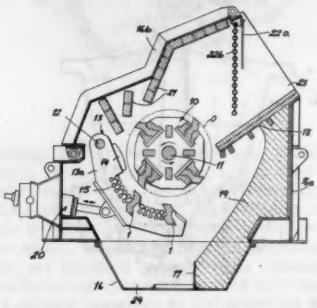
Hydraulic cement of very high strength is ground to a fineness corresponding to a specific surface of 6,000 cm. ^{2}/g. or more as measured by the Blaine method by grinding the clinker to the fineness of ordinary Portland cement, cooling the cement to about room temperature and then grinding the cooled cement by small grinding bodies having an average weight of no more than 6 grams.

3,608,840
NONCLOGGING IMPACT CRUSHER
Mark R. Lange, Joplin, Mo., assignor to New Byers Corporation
Filed Jan. 3, 1969, Ser. No. 788,808
Int. Cl. B02c *13/09, 13/282*
U.S. Cl. 241—167 **6 Claims**



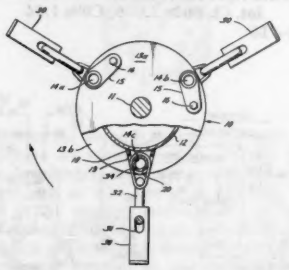
A rock crusher of the type having a confined chamber in which a heavy rotor, carrying a plurality of hammers, contacts large rocks with sufficient force to fracture the rocks and to impel them against spaced parallel breaker bars for further size reduction is provided with self-cleaning features which permits it to handle wet or sticky feed stock without clogging. At least some of the active breaker bars are slowly rotated during operation of the crusher and the wall of the chamber in back of the bars is vibrated to prevent adherence or sticking of material to the bars and wall. The rotating bars may also be provided with intermeshing lobes or with scraper bars to further assist in the self-cleaning.

3,608,841
ROTARY IMPACT CRUSHER
Franz Wageneder, Josef Grimps-Strasse 6, Laakirchen, Austria
Continuation-in-part of application Ser. No. 665,448, Sept. 5, 1967, now Patent No. 3,480,214. This application Mar. 12, 1969, Ser. No. 806,556
Claims priority, application Austria, Mar. 14, 1968, A2520/68
Int. Cl. B02c *13/00, 13/28*
U.S. Cl. 241—189 R **10 Claims**



A rotary impact crusher for rock or the like has an impeller with a plurality of impeller blades, and a plurality of breaker plates. A pivotal cylindrically concave baffle extends along a segment of the blade orbit. The blades are inclined into the direction of impeller rotation at angles of 25° to 45° and have outside edges lying along the orbit. Strips of resilient material wedge the blades into channels in the impeller. Like blades are mounted on the baffle, the faces of these blades being positioned complementarily to the impeller blades.

3,608,842
FLAIL-MOUNTING DEVICE
Anthony R. Engler, Houston, Tex., assignor to Engler Manufacturing Corporation, Houston, Tex.
Filed Apr. 24, 1969, Ser. No. 819,003
Int. Cl. B02c *18/18;* **A01d** *55/22*
U.S. Cl. 241—194 **15 Claims**



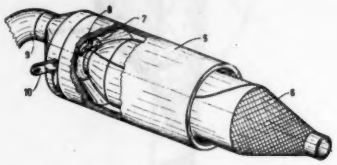
Means for individually mounting and dismounting flail cutting members from a rotor, wherein such means may include apertured positioners fixed to the rotor, rotatable blade holder rod contained within the positioners and having link-receiving portions, and link means connecting the flail cutting blades to the blade holder rod which link means may be so positioned relative to said rod as to permit individual blades or cutting members to be removed or attached.

3,608,843

METHOD AND APPARATUS FOR THE PNEUMATIC REMOVAL OF THE FOOT WINDING OR LAP FROM COPS

Wernfried Siedlich, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter A. G., Horgen, Switzerland

Filed May 29, 1969, Ser. No. 828,975
Claims priority, application Switzerland, June 25, 1968, 9465/68
Int. Cl. B65h *54/22*
U.S. Cl. 242—35.6 E 9 Claims



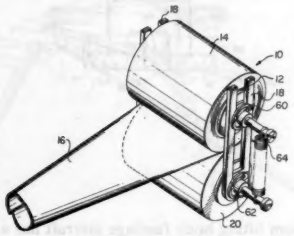
A novel method and apparatus for pneumatically removing the foot winding or lap from spinning cops or bobbins is disclosed. The method aspects of the invention contemplate exposing the foot lap, as the cop rotates, to an airstream over a portion of its circumference, the airstream acting upon the section of the foot lap in an essentially axial direction. The novel apparatus comprises a rotatable support and clamping installation for replaceably receiving the cop as well as a suction tube for surrounding the free end of the cop. The suction tube is tapered in the area of the cop foot and is closed off by a bottom portion at the conical end thereof, the bottom portion having a nozzlelike opening eccentrically disposed outside of the axis of the suction tube, the opening being aligned with the foot lap section acted upon by the airstream when a cop is inserted in the suction tube.

3,608,844

MINIMECH SELF-DEPLOYING BOOM MECHANISM

William T. Tumulty, Jr., Cheverly, and Wayne P. Sours, Silver Spring, both of Md., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 31, 1969, Ser. No. 889,438
Int. Cl. B65h *75/00;* E04h *12/18*
U.S. Cl. 242—54 3 Claims



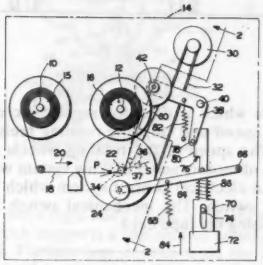
Extendable, self-deploying boom apparatus wherein the boom is of any present type fabricated from thin metal strip having a tendency to unwrap when wound upon a cylindrical storage spool. The end portion of the boom is restrained between the storage spool and a cooperating roller serving first to restrain the boom in place upon the storage spool. Resilient springs compress together the cylindrical surfaces of the spool and roller along a mutual line of pressure, thus producing, in a portion of the boom between rollers, a force acting parallel to the boom major axis. Such force is derived from the storage energy of the boom and will permit self-deployment of the boom when the spool and roller are unrestrained for counterrotating motion. The springs maintain a mutual line of pressure between the rollers as additional portions of the boom progressively unwind. Additional equipment may be utilized, for example, a deployment prevention control, a retracting mechanism, a deployment rate control and an increment deployment control.

3,608,845

TAPE END DETECTING DEVICE FOR TAPE RECORDER

Isao Kozu, and Yukitada Ayukawa, both of Osaka-fu, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Oct. 23, 1969, Ser. No. 868,703
Claims priority, application Japan, Oct. 29, 1968, Oct. 29, 1968, 43/80178;43/80188
Int. Cl. B65h *59/38;* G03b *1/04;* G11b *15/32*
U.S. Cl. 242—186 6 Claims



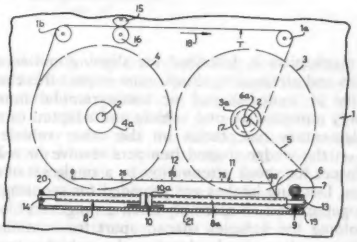
A tape end detecting device for a tape recorder comprising a follower member biased by a tape reel roller member against a cam formed integrally with a motor driven fly wheel so that when transport of the tape is completed the follower is engaged by an activating member also integral with the fly wheel so as to unlatch an associated control member and restore the tape transport to its original stop condition.

3,608,846

TAPE RECORDER

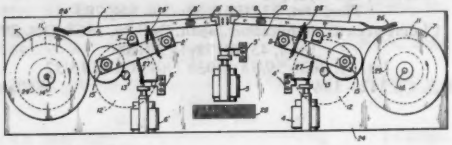
Hanswerner Pieplow, Nurnberg, Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsonstalt, Fuerth am Bayern, Germany

Filed Feb. 10, 1970, Ser. No. 10,246
Claims priority, application Germany, Mar. 14, 1969, P 19 12 990.9
Int. Cl. G11b *15/32;* G03b *1/04*
U.S. Cl. 242—201 10 Claims



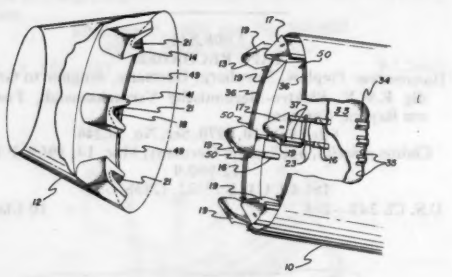
The pointer which is movable along a scale on the deck of a tape recorder to indicate that length of tape which is available for recordal or reproduction of sound has a follower which tracks the thread of a spindle driven by the takeup reel at a speed which varies as a function of changes in diameter of tape which is convoluted on the core of the takeup reel. The graduations of the scale are equidistant from each other; therefore, the pitch of the thread on the spindle varies as a function of changes in rotational speed of the takeup reel when the tape is transported at a constant speed.

3,608,847
ELECTROMECHANICAL REEL ASSEMBLY ATTACHMENT FOR A TAPE DECK
Wayne T. Hufford, Tulsa, Okla., assignor to Cherokee Electronics Co., Inc., Oklahoma City, Okla.
Filed May 8, 1969, Ser. No. 822,999
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—204 2 Claims



Apparatus which is used for rapidly increasing and controlling the speed and stopping rotating reels in a tape deck assembly. The speed of the rotating wheels being regulated by a system of motors and a braking system which is made effective by an electrical control system which is actuated by a mechanical switch. The mechanical switch being part of a console housing the tape deck.

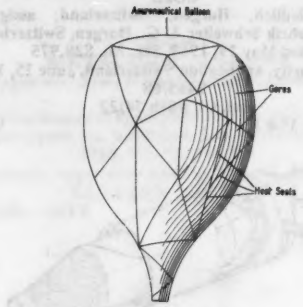
3,608,848
DOCKING MECHANISM
Myron A. Cantor, Rolling Hills; Harry S. Greenberg, Tustin, and Clifford H. Parks, Diamond Bar, all of Calif., assignors to North American Rockwell Corporation
Filed Oct. 21, 1968, Ser. No. 769,276
Int. Cl. B64g *1/00*
U.S. Cl. 244—1 7 Claims



A mechanism is described for aiigning and securing two vehicles and attenuating shock upon impact therebetween. A plurality of wedge-shaped or semipyramidal bumpers are yieldably mounted on one vehicle and adapted to mate with complementary receptacles on the other vehicle. Sloping faces on the wedge-shaped bumpers resolve or redirect impact forces for shock attenuation by a single set of shock absorbers. Docking latches are provided for securing the vehicles together and an assembly latch arrangement is provided for holding the vehicles spaced apart for a minimum heat transfer or alternatively drawing the vehicles together for operation.

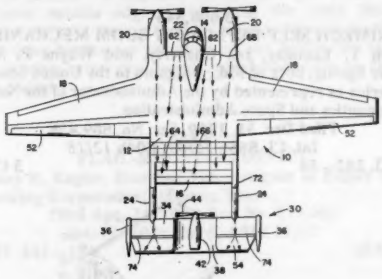
3,608,849
AERONAUTICAL BALLOONS
William F. Underwood, Oak Park, Ill., assignor to Union Carbide Corporation, New York, N.Y.
Continuation-in-part of application Ser. No. 698,756, Jan. 18, 1968, now abandoned. This application July 10, 1969, Ser. No. 840,635
Int. Cl. B64b *1/40*
U.S. Cl. 244—31 4 Claims

An aeronautical balloon is fabricated from a biaxially oriented plastic film which is obtained from a polyolefin resin



composition comprising a homopolymer of copolymer of ethylene of at least about 50 percent by weight.

3,608,850
LIFTING BODY BOUNDARY LAYER CONTROL
Charles G. Fredericks, Silver Spring, Md., assignor to Occidental Aircraft Corporation, Washington, D.C.
Filed Sept. 26, 1969, Ser. No. 861,361
Int. Cl. B64c *21/02*
U.S. Cl. 244—36 8 Claims

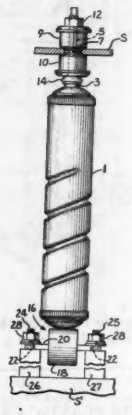


A twin boom lifting body fuselage aircraft has airflow control ports adjacent leading and trailing edges of the airfoil lifting body. Preferred embodiments have interconnected ram air intake means in fuselage booms and air outlets along a trailing edge of a horizontal stabilizer. An engine mounted in a channel section of the horizontal stabilizer produces a low pressure area near the upper trailing portion of the lifting body promoting flow through the air control ports, thereby reducing drag and increasing lift of the aircraft.

3,608,851
SHOCK ABSORBER MOUNTING ASSEMBLY
Richard D. Anderson, 866 S. Charles Street, Elgin, Ill.
Filed Dec. 18, 1968, Ser. No. 784,624
Int. Cl. F16f *15/00*
U.S. Cl. 248—15 6 Claims

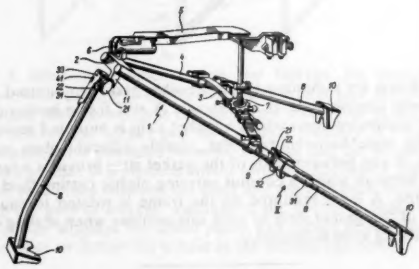
A shock absorber mounting assembly in which the shock absorber is provided with an axially extending stud at each

end for mounting the shock absorber between the structures which are to be shock insulated from each other and an off-



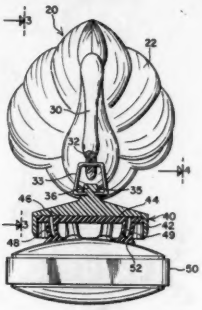
set bracket is fitted on one of the studs and mounts the stud to one of the structures.

3,608,852
SUPPORT FOR LIGHT AUTOMATIC FIREARMS
Kurt Horn, Oberndorf, Germany, assignor to Heckler & Koch GmbH, Oberndorf, Germany
Filed July 29, 1970, Ser. No. 59,058
Claims priority, application Germany, July 30, 1969, P 19 38 593.4
Int. Cl. F41c *27/00*
U.S. Cl. 248—166 **8 Claims**



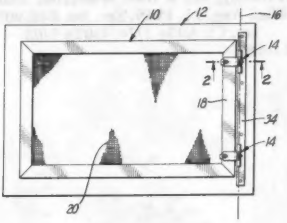
A tripodlike support for automatic firearms comprises a frame incorporating two divergent tubes coupled at one end by means of an angle member which member and the ends of the two tubes are provided with pivot mountings for legs which are adapted to fold to a compact structure. The legs are mounted on pivot pins associated with toothed detent members engageable by displacement of the pivot pins by means of release levers. Each release lever incorporates a displaceable stop or abutment which is adapted to be placed between the release lever and the end of the pivot pin when the lever is raised for operating purposes but which enables the release lever to lie snugly against the leg under normal service conditions thus avoiding projecting parts which might catch in obstructions or entanglements during transport under service conditions.

3,608,853
SOAP-HOLDING APPLIANCE EMPLOYING VACUUM CUPS
Anthony Sertich, 346 East 29th St., Brooklyn, N.Y.
Filed Mar. 9, 1970, Ser. No. 17,804
Int. Cl. A45d *40/00*
U.S. Cl. 248—309 **9 Claims**



A soap holder has a rigid body which is attachable to a vertical wall and which supports a cup-shaped member in which is a flexible pad. Flexible legs depend from the lid and are formed with integral suction cups. The cup-shaped member may be pivotally attached to the rigid body. The flexible legs may be hollow or solid. A space may be defined between the pad and cup-shaped member into which the pad can flex when the legs and cups bend to conform to the curved surface of a piece of soap.

3,608,854
HINGE CLAMP
Kaino J. Hamu, 4013 North Durfee Ave., El Monte, Calif.
Filed Nov. 19, 1969, Ser. No. 878,157
Int. Cl. E05d *7/04*
U.S. Cl. 248—316 A **4 Claims**

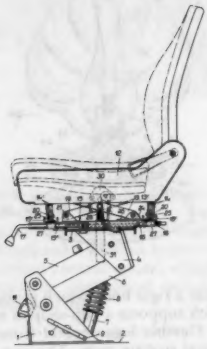


A hinge clamp for releasably and hingably attaching a bar to a support. The clamp has a pair of angle brackets whose interior corners open toward one another to define between the brackets an effective opening for receiving the bar endwise in a manner such that the bar is cradled between the flanges of each bracket. A mounting plate hinged to one bracket on a hinge axis parallel to the axis of the opening, and clamp means for urging the brackets toward one another to firmly and positively grip the bar. A primary application of the hinge clamp is attaching a silk screen frame to a frame support.

3,608,855
ADJUSTABLE SEATING STRUCTURE, PARTICULARLY FOR AUTOMOBILES
Werner Osenberg, Opladen, Germany, assignor to Bremshey & Co., Osnalbrueck, Germany
Filed Feb. 19, 1969, Ser. No. 800,585
Claims priority, application Germany, Feb. 27, 1968, P 17 29 966.0
Int. Cl. B60n *1/02*
U.S. Cl. 248—400 **5 Claims**

A seating structure which is adjustable and designed particularly for automobiles and the like. The seating structure

includes a lower frame fixed to the floor of the vehicle and an upper seating frame situated over and spaced from the lower frame. An intermediate adjustable assembly is situated between the upper frame and the lower frame and is carried by the lower frame while being adjustable to adjust the elevation of the upper seating frame with respect to the lower



frame. An adjustable spring assembly is operatively connected with the lower frame to provide for the latter a resilient resistance to a given load so that by adjusting the yieldability of the lower frame with respect to a given load it is possible for an individual to be very comfortably seated.

At the same time the elevation of the seat can be adjusted independently of the adjustment for the particular load.

3,608,856

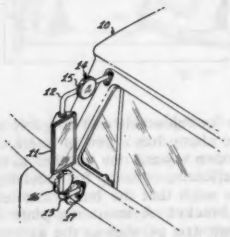
MIRROR MOUNTING BRACKET

George G. T. Hurley, 922 B West Monterosa, Phoenix, Ariz.

Filed Aug. 11, 1969, Ser. No. 848,905

Int. Cl. A47g *1/24*; G02b *5/08*

U.S. Cl. 248—480 **1 Claim**



A mirror mounting bracket, particularly for a rear view mirror of a vehicle, in which the rotation of the mirror held on the bracket serves to operate the clamp to secure the mirror in mounting position of the motor vehicle.

3,608,857

CHANNEL CLIP FOR T-BARS

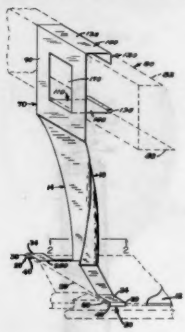
Richard H. Hibbeler, 7603 Sherman Drive, Omaha, Nebr.

Filed Dec. 11, 1969, Ser. No. 884,231

Int. Cl. E04g *17/18*

U.S. Cl. 248—317 **12 Claims**

A channel clip for suspending a ceiling-supporting T-bar from a horizontal channel comprising a shank portion having a pair of hooks at its lower end for resiliently gripping the T-



bar and having at its upper end projecting transverse portions adapted to hook about the flanges of a channel.

3,608,858

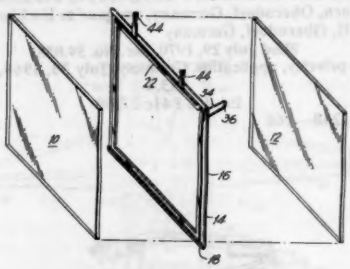
GASKET FRAME FOR PLASTIC CASTING APPARATUS

John O. Beattie, Riverside, and James Jay Ferris, Old Greenwich, both of Conn., assignors to The Polycast Corp., Stamford, Conn.

Filed Oct. 7, 1968, Ser. No. 765,554

Int. Cl. B41b *11/04*

U.S. Cl. 249—160 **5 Claims**



A frame for mounting a compressible gasket to be used in a plastic casting apparatus is shown. A stiff frame having an inner perimeter upon which a gasket strip is mounted seals a casting zone between two, flat, closely adjacent glass surfaces. A gap between ends of the gasket strip provides a feed zone through which a conduit carrying plastic casting fluid is inserted. A lever mounted on the frame is rotated to cause ends of the gasket strip to abut one another when sealing of the casting zone is desired.

3,608,859

CONTROLLABLE CHECK VALVE

Walter Hetzer, Haidholzen, Germany, assignor to Messerschmitt-Bolkow Gesellschaft mit Beshrankter Haftung, Ottobrunn, near Munich, Germany

Filed Apr. 15, 1969, Ser. No. 816,324

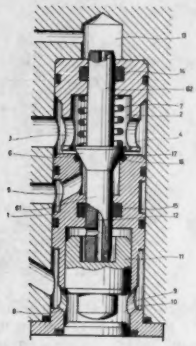
Claims priority, application Germany, Apr. 23, 1968, P 17 50 341.2

Int. Cl. F16k *31/143*

U.S. Cl. 251—63.4 **1 Claim**

A controllable check valve, for a hydraulic system, includes a relatively elongated body having means defining a valve zone, fluid inlet means and fluid outlet means. The body is formed with a frustoconical valve seat between the inlet and outlet means. A valve member is displaceable longitudinally in the body and is formed with a frustoconical valve seating surface sealingly engageable with the valve seat.

Stems extend in opposite longitudinal directions from the frustoconical valve seating surface, and slide in closely fitting bores in the valve body to serve as guides for the valve member. During longitudinal displacement of the valve



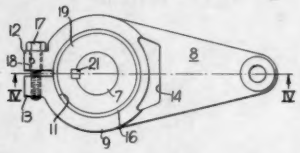
member, these stems project through the valve zone through at least the length of the possible valve stroke. Packings are provided in the valve housing, spaced from the valve zone, and engage the stems which extend outside the valve zone in at least one operating position of the valve member.

3,608,860

WICKET-GATE-RESTRAINING DEVICE

John M. Horn, York, Pa., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 12, 1969, Ser. No. 875,625
Int. Cl. F16k *31/52*; **F16d** *1/06, 3/14*
U.S. Cl. 251—79 **3 Claims**



A frictional connection in the linkage for controlling hydraulic turbine wicket gates. Each wicket gate is provided with a shaft to which is connected an arm which is operated to revolve the wicket gate to a desired position. A frictional connection is provided between the arm and the wicket gate shaft so that if a predetermined torque is exceeded, slippage will take place between the shaft and the arm prior to damaging the gate or linkage. Because of the frictional connection, after the slippage has taken place, the wicket gate is not free to rotate or flutter but is held in the slipped position.

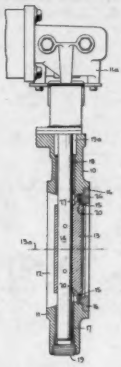
3,608,861

BUTTERFLY VALVE SEAT

David A. Helman, Berlin; Michael E. Miles, Northborough, and James F. Donnelly, Worcester, all of Mass., assignors to Jamesbury Corporation, Worcester, Mass.

Filed May 28, 1968, Ser. No. 732,729
Int. Cl. F16k *5/16*
U.S. Cl. 251—173 **9 Claims**

In a butterfly valve of the type wherein an annular flexible seat ring circumscribing the fluid flow channel cooperates with an inclined circumferential sealing surface on a rotatably mounted butterfly disc to open and close the flow channel, an improvement is made to permit the valve to resist internal fluid pressure with equal effectiveness regardless of the direction from which applied. The disc deflects in the downstream direction to the same extend upon the application of a given fluid pressure (up to the design pressure of the valve) regardless of the direction from which the pressure is applied; whereas the annular flexible seal tends to deflect to



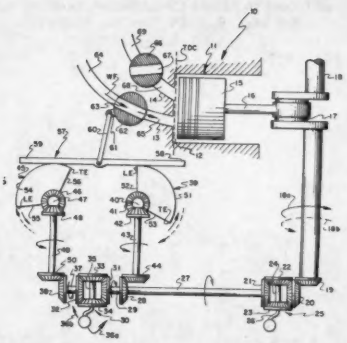
a greater extent than this when the pressure is applied from the direction of convergence of the inclined circumferential sealing surface and to a lesser extent than this when the internal fluid pressure is applied from the opposite direction.

3,608,862

VARIABLE DWELL CAM ADVANCE MECHANISM

Douglas Ray Paxton, 426 31st St., Newport Beach, Calif.

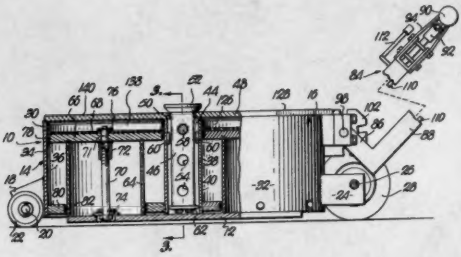
Filed May 21, 1969, Ser. No. 826,628
Int. Cl. F16k *31/524*
U.S. Cl. 251—229 **10 Claims**



A pair of radial cams bear against a common cam follower whose motion controls the operation of a valve, such as an inlet valve for admitting a working fluid into a power cylinder. When raised segments of both cams simultaneously engage the cam follower then the cam follower is sufficiently raised to fully open the valve. The dwell period of the cam follower in its raised position dictates the time during which the valve remains fully open. The cam follower dwell period can be varied by adjusting the angular relationship between the cams.

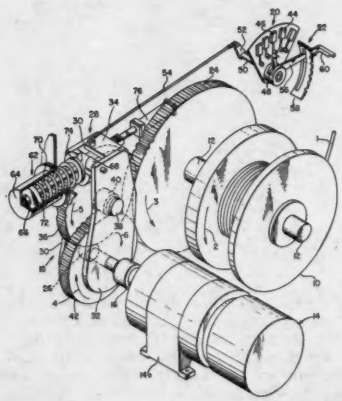
A reversing control interconnects the cams and a drive shaft in order to selectively reverse the rotational direction of the drive shaft. The valve is coupled to a quick opening mechanism and is also coupled to a quick closing mechanism which serves to snap the valve closed when cams and the cam follower move to predetermined positions.

3,608,863
DUAL-CYLINDER VEHICLE LIFT
Gilbert W. Gaardner, and Edwin L. Vollmer, both of St. Joseph, Mo., assignors to Gray Manufacturing Company, Inc., St. Joseph, Mo.
Filed May 1, 1969, Ser. No. 820,856
Int. Cl. B66f 3/24
U.S. Cl. 254—93 HP 11 Claims



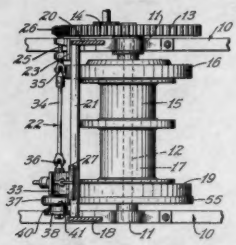
A vehicle lift primarily intended for lifting loaded trucks and trailers at the axle, the lift having a portable base, there being a pair of shiftable cylinders on the base and means for shifting the cylinders between a lowered position and raised positions, such means including a compressed air plumbing system for the lift whereby air may be delivered into a tubular handle which is pivotally mounted with respect to the common top plate of the cylinders and thence into a space defined by said top and a fixed piston and packing seal corresponding to each cylinder whereby the cylinders are raised; there being a centrally disposed lift post coupled with the cylinders and adjustable vertically with respect thereto whereby the effective height of the lift may be selectively adjusted.

3,608,864
CONSTANT-TENSION WINCH
Larry L. Dargitz, and Arthur J. Muhlbeier, both of Skagit, Wash., assignors to Skagit Corporation, Sedro Wooley
Filed Mar. 5, 1969, Ser. No. 804,522
Int. Cl. B66d 1/48
U.S. Cl. 254—172 5 Claims



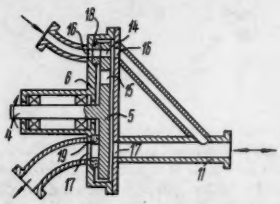
A winch drum is coupled to an electric motor through a gear train, one section of which constitutes a cable drumline tension sensitive mechanism capable of changing position responsive to changes in cable drumline tension. An automatic tension control mechanism is coupled to the cable drumline tension sensitive mechanism for activation thereby to control the operation of the electric motor so as to maintain cable drumline tension between predetermined limits.

3,608,865
DRAGLINE HOIST ATTACHEMENT
Delbert J. Kirk, Willernie, Minn.
Filed Feb. 18, 1969, Ser. No. 800,070
Int. Cl. B66d 1/24
U.S. Cl. 254—187 4 Claims



A dragline hoist attachment is provided to increase the speed at which the dragline is reeled in during back-casting operations. A friction wheel is provided engageable with the clutch rim of the dragline hoist drum, and which is rotated at a peripheral speed much higher than the normal peripheral speed of the clutch rim. Means are provided to engage this friction wheel with the clutch rim as the bucket is swinging toward the cab, reeling in the slack at a relatively high rate.

3,608,866
PNEUMATIC PULSATOR FOR IMPARTING VIBRATORY MOTION TO LIQUID IN A CONTAINER
Susanna Mikhailovna Karpacheva, 2 Shukinsky proezd, 2, kv. 88; Valerian Matveevich Muratov, Astakhovsky pereulok, 1/2, kv. 118; Leonid Solomonovich Raginsky, Nikitinskaya ulitsa, 16, Korpus 1, Kv. 29; Igor Viktorovich Ilgisonis, 7 Parkovaya ulitsa, 2, Korpus 4, kv. 20, and Noi Mikhailovich Adamsky, Novaya Bodraya ulitsa, 7, Kv. 45, all of Moscow, U.S.S.R.
Filed Oct. 22, 1968, Ser. No. 769,622
Int. Cl. B01f 3/00
U.S. Cl. 259—1 7 Claims

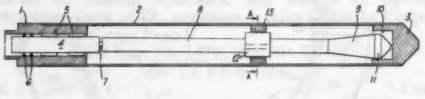


A pneumatic pulsator is provided for imparting vibratory motion in a liquid in a container, and the pulsator comprises a rotatable slide valve in the form of a disc, housed in a body with an inlet port and exhaust port, the disc having one or more holes or slots for periodically providing communication between the liquid in the container with a compressed air line or the atmosphere. The container is connected to the exhaust port by an outlet pipe which is coaxial with the exhaust port.

3,608,867
VIBRATORS
Percival George Hunter, New Malden, Surrey, England, assignor to Fyne Machinery & Engineering Limited, London, England
Filed July 7, 1969, Ser. No. 839,604
Claims priority, application Great Britain, May 2, 1968, 37,111/68
Int. Cl. B01f ; B28c
U.S. Cl. 259—1 1 Claim

A vibrator, such as used in concrete mixes, comprises a cylindrical casing in which a rotor in the form of a pendular

mass is suspended and rotatably driven. The rotor is causes to gyrate in rolling contact in the casing by coacting lobes



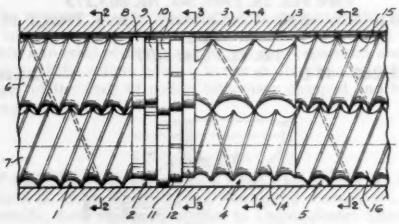
and recesses, and these lobes and recesses are located intermediately between the ends of the pendular rotor, e.g. at about two-fifths of the length of the rotor from its free end.

3,608,868

CONTINUALLY MIXING AND KNEADING DEVICE WITH TWO OR MORE SCREWS FOR A PLASTICIZABLE MATERIAL

Heinz Koch, Ludwigsburg, Germany, assignor to Werner & Pfleiderer, Stuttgart-Feuerbach, Germany

Filed Nov. 20, 1968, Ser. No. 777,367
Claims priority, application Germany, Dec. 16, 1967, P 16 79 884.8
Int. Cl. B01f *7/02*; B29b *1/10*
U.S. Cl. 259—6 **7 Claims**



A continuously operating device for homogeneously mixing components of a plasticizable material has an input zone including unidirectionally rotating meshing screw elements for mixing components of the material received therein and feeding the mixed components to a dispersion zone also including rotatable meshing screw elements. The dispersion zone, in turn, conveys the components received therein from the input zone, after dispersing the same, to a mixing zone the screw elements of which have fewer threads than the screw elements in the dispersion zone and are preferably not in mesh whereby the components are homogeneously mixed when leaving the mixing zone. Instead of using one dispersion zone and one mixing zone two or more such couples may be provided in one device. Due to the arrangement of the screw elements in the mixing zone the desired homogeneous mixture is obtained at the downstream end of the mixing zone.

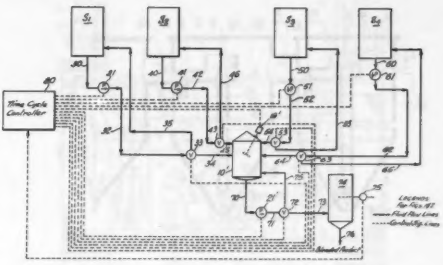
3,608,869

SYSTEM FOR BLENDING LIQUID INGREDIENTS

Robert A. Woodle, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 28, 1969, Ser. No. 828,560
Int. Cl. B01f *7/00*; B28c *7/04*
U.S. Cl. 259—7 **7 Claims**

Disclosed is a system for automatically blending liquid ingredients which is useful to continuously or discontinuously provide blended products. A mixing vessel having an agitator is provided for blending the ingredients. Each of the liquid ingredients is admitted thereto in the form of a stream introduced at a uniform flow rate for a time interval proportional to the desired concentration in the product mixture of each respective ingredient. The individual time intervals of flow are kept small compared to the volume of the mixing vessel and are arranged sequentially so that ingredient segments of the product mixture are continuously added to the mixing vessel. The vessel is always maintained full by withdrawing the mixture at a rate equal to the rate at which the ingredients are added. Automatic time cycle control means and valves are provided so that the operating sequence can be rapidly performed and continuously repeated providing the capability of producing a continuous



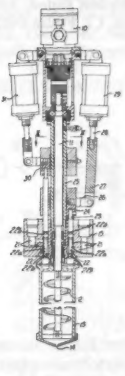
stream of the blended mixture. An output storage tank is provided which is fitted with a level controller which starts up and shuts down the blending system to meet varying output quantity demands of the blended products.

3,608,870

FOAMABLE MIXTURE DISPENSING HEAD

John Brian Aldridge, Manchester, England, assignor to Vitafoam Limited

Filed Mar. 28, 1969, Ser. No. 811,555
Claims priority, application Great Britain, Mar. 29, 1968, 15093/68
Int. Cl. B01f *7/24*, *15/02*
U.S. Cl. 259—23 **6 Claims**



A dispensing head for dispensing foam mixtures, the dispensing head including a mixing chamber having an impeller mounted within the mixing chamber, first feed and return lines for simultaneously admitting premixed nonreactive components and reactive components to the mixing chamber, and second feed and return lines for simultaneously admitting a second premixed nonreactive component and the reactive component to said mixing chamber.

3,608,871

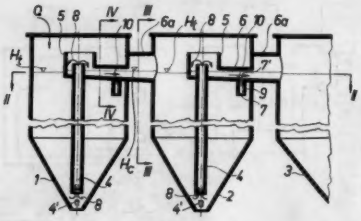
LEVEL-REGULATING APPARATUS FOR TANKS CONNECTED IN SERIES

Jozsef Harsanyi, Budapest; Geza Pinter, Budapest; Zoltan Pais, Ajka, and Zoltan Toth, Ajka, all of Hungary, assignors to Aluterv Aluminiumipari Tervezo Vallalat, Budapest and Ajkai Timfoldgyar es Aluminiumkoho, Ajka, Hungary

Filed Nov. 10, 1969, Ser. No. 875,097
Claims priority, application Hungary, Nov. 29, 1968, AU-205
Int. Cl. B01f *5/12*
U.S. Cl. 259—95 **6 Claims**

Continuous flow apparatus for maintaining solid particles suspended in liquid for a predetermined period of time, as in

alumina production. The suspension passes through a plurality of tanks in series, and is agitated by flowing upwardly through a vertical stirring tube. The suspension that flows out of the upper end of the stirring tube is directed toward the

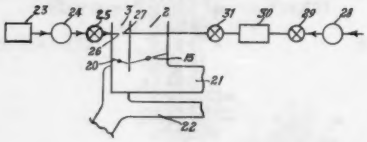


next tank by a channel that has a drain for returning a portion of the lifted material to the tank from which it was lifted. Preferably, the drain is a conduit that extends downwardly from the channel, and the height of the channel within the tank is less than the height of the channel between tanks.

3,608,872
ENGINE FUEL SUPPLY HAVING SEPARATE AIR AND FUEL MIXING BORES

Junzo Uozumi; Toshikazu Suzuki; Kaneo Kuno; Kazuo Kikuchi, and Junki Iwata, all of Aichi, Japan, assignors to Aisan Kogyo Co., Ltd., Aichi Prefecture, Japan

Filed July 10, 1969, Ser. No. 840,617
Claims priority, application Japan, July 18, 1968, 43/50687
Int. Cl. F02m *69/04*
U.S. Cl. 261—28 **1 Claim**



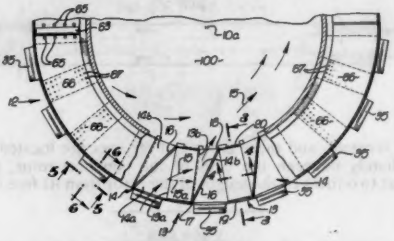
A fuel supply system for an internal combustion engine, said system having a performance equal to that of a two-stage carburetor over a wide range of operation from small to large fuel requirements. The system has a first bore for regulating the inflow of air and a second parallel bore for mixing fuel with air. A throttle valve is provided in each bore and one of the throttle valves is connected to a fuel metering device. Metered fuel is injected into the fuel mixing bore at a Venturi that has a diameter considerably less than the diameter of the air inflow bore. In a second device, the fuel injection system controls fuel quantity by air jet pressure. In the last embodiment, the fuel metering device comprises pure fluid amplifiers which are controlled by pressure within the fuel and air mixing bore.

3,608,873
MECHANICALLY ASSISTED SPIRAL-DRAFT WATER-COOLING TOWER

Donn B. Furlong, Santa Rosa, Calif., assignor to Fluor Products Company, Inc., Santa Rosa, Calif.

Filed Oct. 15, 1969, Ser. No. 866,446
Int. Cl. B01f *3/04*
U.S. Cl. 261—30 **18 Claims**

A forced-draft cooling tower employs fans, passages to receive fan-displaced air or gas, and packing sections spaced about the tower axis so that positive swirling of the gas or air

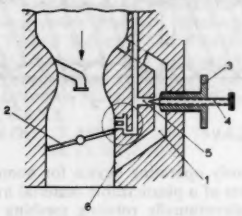


about that axis within the tower interior is produced as the flow passes through the passages and packing sections.

3,608,874
CARBURETOR FOR INTERNAL COMBUSTION ENGINES

Rudolf Beckmann, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Feb. 28, 1969, Ser. No. 803,273
Claims priority, application Germany, Mar. 1, 1968, P 16 01 994.6
Int. Cl. F02m *3/00*
U.S. Cl. 261—41 D **2 Claims**



A carburetor for an internal combustion engine having a bypass channel around a throttle valve and means to adjust the flow in the channel.

3,608,875
VALVE TRAY FOR COLUMNS WITH MASS TRANSFER

Ernst Kriegel, Essen, Germany, assignor to Fried Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Nov. 14, 1968, Ser. No. 775,768
Claims priority, application Germany, Nov. 14, 1967, P 16 42 940.6
Int. Cl. B01d *3/20*
U.S. Cl. 261—114 A **4 Claims**

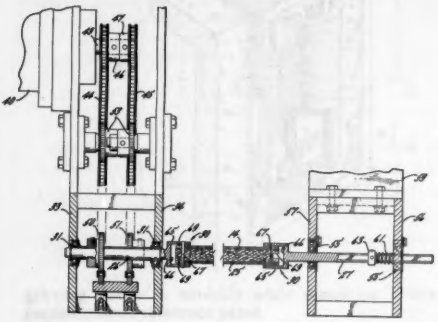
In combination with a valve tray for mass-transfer columns which has a great number of openings for the passage of vapor, a cover structure which comprises disc elements to close and open the openings and interconnected by links so as to form a chain of discs while the outer discs are attached by links to the tray is the object of the invention.

3,608,876

HEAT-TREATING APPARATUS WITH ROLLER-TYPE HEARTH

Charles E. Leaich, Rockford, and Edwin L. Springer, Belvidere, both of Ill., assignors to Alco Standard Corporation, Valley Forge, Pa.

Filed Apr. 10, 1970, Ser. No. 27,339
Int. Cl. F27b 9/24
U.S. Cl. 263—6 C 7 Claims



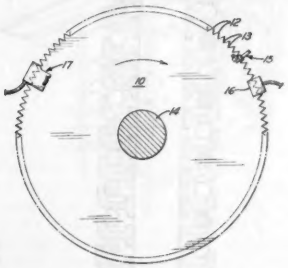
The ceramic hearth rollers of a kiln are connected to driving and supporting shafts by pin-and-slot connections which enable universal pivoting and lengthwise expansion and contraction of the rollers relative to the shafts while reducing the danger of the ends of rollers becoming chipped and broken during service use.

3,608,877

APPARATUS FOR TREATING CIRCULAR SAW BLADES

Edward H. Dehn, Oil City, and Fernand J. Dewez, Jr., Monroeville, both of Pa., assignors to United States Steel Corporation

Division of Ser. No. 711,261, Mar. 7, 1968. Filed Nov. 9, 1970, Ser. No. 88,030
Int. Cl. C21d 1/66
U.S. Cl. 266—4 E 4 Claims



An apparatus for hardening the teeth and tooth roots of a saw blade used for cutting hot steel shapes. Blade rotates, while its teeth and roots are heated to the austenitizing temperature and quenched by a stationary induction-heating unit and a stationary quenching device. Shield applied to blade to prevent reheating and softening of portion first heated as it reenters heating unit. The hardening treatment forestalls failure through fatigue cracking at the roots.

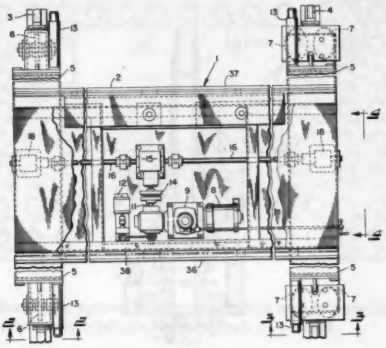
3,608,878

FLAME CUTTING MACHINE

Roy H. Dreshman, Munhall, Pa., assignor to R. H. Dreshman & Sons, Inc., Homestead, Pa.

Filed Aug. 1, 1968, Ser. No. 749,356
Int. Cl. B23k 7/00
U.S. Cl. 266—23 9 Claims

Flame cutting machine for cutting iron or steel plates, bars, structural shapes, castings, etc. characterized in the provision of a variable speed positive drive means for the rail mounted torch carriage or gantry thereof by which the carriage is driven in smooth, uniform manner at any cutting speed between zero and maximum, said drive means being mounted



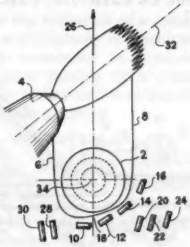
on the carriage for floating movement to accommodate misalignment of the carriage guide rails. Machine further characterized in the provision of floating positive drive means for rapid traverse of the carriage.

3,608,879

DEVICE FOR TRIMMING FLASH FROM METAL WHICH HAS BEEN WORKED WITH A MACHINING TORCH

Jacques Birr, Paris; Michel Donze, Nancy; Bernard Abel, Epinal, France, and Patrice Charbonnier, Pointe Noire, Congo, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Erploitation des Procedes Georges Claude

Filed Nov. 22, 1968, Ser. No. 805,918
Claims priority, application France, Nov. 23, 1967, 129347
Int. Cl. B23k 7/02
U.S. Cl. 266—23 H 2 Claims



Oxygen is blown through orifices against the flash resulting from the scarfing when the flash is still hot and can burn in oxygen.

Orifices are provided for the place where the scarfing has started, other orifices for the lateral flash produced during the scarfing pass.

3,608,880

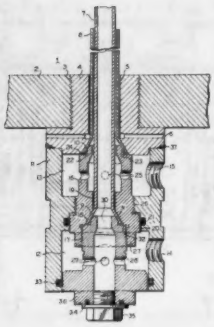
BLAST FEED DEVICE FOR A STEEL CONVERTER

Marcel Gombert, Metz-Queuleu; Pierre Leroy, St. Germain en Laye, and Emile Sprunck, Moyeuvre-Grande, all of France, assignors to Wendel-Sidelor and Compagnie des Ateliers et Forges de la Loire (St-Charmand, Firming, St-Etienne, Jacob Holtzer)

Filed Jan. 23, 1970, Ser. No. 5,303
Claims priority, application France, Jan. 28, 1969, Nov. 6, 1969, 6,901,640;6,938,151
Int. Cl. C21c 7/00
U.S. Cl. 266—34 T 14 Claims

This device for supplying wind to be blown through the bottom of a steel converter, adapted to ensure a double yet

separate feed to the blast tuyeres and wherein said tuyeres comprise for each blowhole a pair of concentric metal tubes adapted to be supplied with different gaseous substances, such as a combustive agent, for instance pure oxygen, and a cooling gas such as water steam or carbon dioxide gas, said



device comprising essentially a body constituting a two-compartment chamber, each compartment being adapted to supply a specific substance annularly to at least one injector having its head engaged in a fluidtight manner against the base of the particular one of the pair of tubes of each tuyeres which it is intended to supply with this gaseous substance.

3,608,881

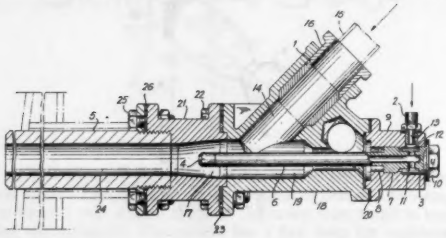
TUYERE APPARATUS FOR USING LIQUID FUEL IN THE FUMING PROCESS

Yordan Todorov Yordanov; Georgi Ivanov Abrashev; Georgi Tenev Georgiev; Velyo Dimitrov Zhekov; Yancho Hristov Yanev; Ivan Georgiev Rossenov; Velcho Angelov Prodanov, and Yordan Todev Roussev, all of Plovdiv, Bulgaria, assignors to Kombinat Za Zvetni Metali, Dimiter Blagoev, Plovdiv, Bulgaria

Filed Mar. 24, 1967, Ser. No. 625,850

Int. Cl. C21b *7/16*; C21c *5/48*

U.S. Cl. 266—41 **6 Claims**



A tuyere is provided for feeding liquid fuel, under a pressure of about 15 atmospheres, and air into a slag formed in nonferrous processes.

3,608,882

ELASTOMERIC BUFFER MOUNTING ASSEMBLY

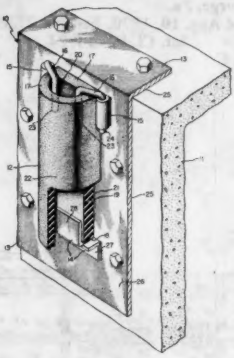
William F. Culp, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 20, 1969, Ser. No. 851,626

Int. Cl. B60r *19/08*; E02b *3/22*; F16f *1/36*

U.S. Cl. 267—140 **10 Claims**

An improved bumper assembly for use on a rigid structure including an elongated resilient bumper member having a longitudinally extending bore in at least the top portion thereof and preferably of a D-shaped cross-sectional configuration, a mounting clip for the bumper member which is attached to the structure having retaining means attached to its lower end portion to hold the bottom portion of the bumper and removable attaching elements in engagement with the bumper member to hold its top portion. The removable elements make it possible for the bumper to be installed in or removed from the bumper assembly without distortion or



bending. The invention is particularly useful in providing means to absorb the impact of a moving vehicle, such as a truck, ship, or crane, as contact is made with a rigid structure.

3,608,883

SPRING

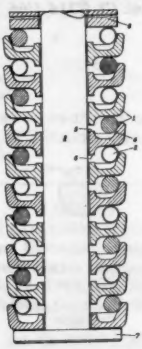
Maximilian Russold, and Heribert Sidan, both of Judenburg, Austria, assignors to Steirische Gubstahlwerke Aktiengesellschaft, Wien I, Schreyvogelgasse, Austria

Filed June 17, 1969, Ser. No. 833,960

Claims priority, application Austria, June 18, 1968, A5844/68

Int. Cl. F16f *1/38*

U.S. Cl. 267—152 **12 Claims**



A heavy-duty spring device with a series of axially arranged rigid outer rings and having resilient split inner rings sandwiched axially therebetween. The inner and outer rings have curved interacting surfaces whereby, upon the application of an axial force, the inner rings are compressed with the axial force being substantially absorbed.

3,608,884

WORKHOLDER

Marion W. Humphreys, 5631 North East 16 Terrace, Fort Lauderdale, Fla. (Addie Humphreys, surviving spouse)

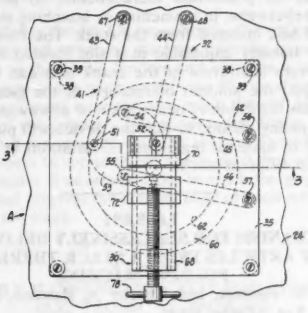
Filed Mar. 5, 1969, Ser. No. 804,392

Int. Cl. B25b *1/22*; B23q *3/18*

U.S. Cl. 269—82 **3 Claims**

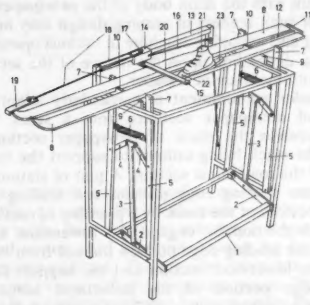
A workholder comprising a work gripping device at one end of a parallel motion arm which is connected at the op-

posite end to a stationary surface over which the work



gripping device is movable while remaining oriented in a predetermined reference plane.

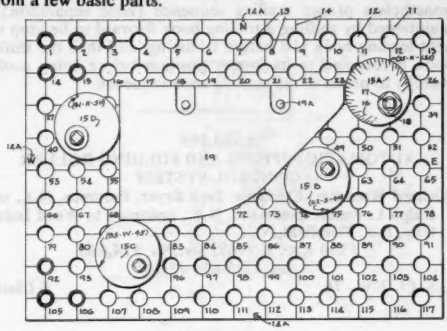
3,608,885
ASSEMBLY BENCH, ESPECIALLY FOR SKI BINDINGS AND SKI REPAIRS
Hans-Werner Roth, Ziegeleistrasse 14/1, 593 Huttental-Weidenau, Germany
Filed Jan. 21, 1969, Ser. No. 792,406
Claims priority, application Germany, Jan. 19, 1968, Sept. 18, 1968, Nov. 29, 1968, R 36 730; G 67 50 925.5; G 68 09 127.0-7402
Int. Cl. B25b *1/16*
U.S. Cl. 269—158 **8 Claims**



An assembly bench for the mounting of bindings and ski repairs, which comprises holding means with two clamping jaws on each side of the assembly bench and with an intermediate spacer, the clamping jaws which are spring urged so as to be under pull stresses, are by means of a foot lever and through the intervention of a spreader linkage adapted to be spread apart, said assembly table having associated therewith a measuring device.

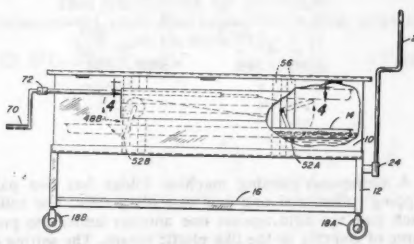
3,608,886
SYSTEM OF DIGITAL JIGGING
Gary Y. Greene, Route 6, Box 16, Hickory, N.C.
Filed June 11, 1969, Ser. No. 832,198
Int. Cl. B23q *3/00*
U.S. Cl. 269—305 **7 Claims**

Instead of forming and storing a separate jig for each workpiece which is to be subjected to a machine operation or other workprocess, a series of cams are set in coded positions by reference to a code table consisting of digital symbols which makes it possible to reform a jig at any future time from a few basic parts.



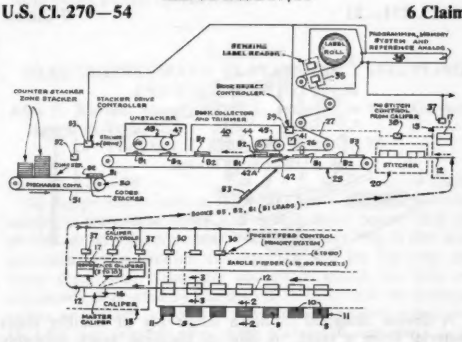
The devising a system of digital symbols makes possible to use the process in sophisticated methods of control.

3,608,887
DISSECTING TABLE
Charles D. Rose, 739 South 83rd East Ave., Tulsa, Okla.
Filed May 5, 1969, Ser. No. 821,705
Int. Cl. A61g *13/00*
U.S. Cl. 269—322 **5 Claims**



A device for use in the retention of a cadaver, the cadaver tray is adjustable in a multiplicity of positions by means of a lifting arm assembly connected to a chain and sprocket operated by the manual turning of a crank. The tank in which the cadaver tray is disposed is releasable from the supporting frame to facilitate cleaning.

3,608,888
SIGNATURE GATHERING
William B. McCain, Hinsdale, and James F. Cosgrove, Western Springs, both of Ill., assignors to McCain Manufacturing Corp., Chicago, Ill.
Filed Oct. 16, 1969, Ser. No. 866,892
Int. Cl. B65h *39/06*
U.S. Cl. 270—54 **6 Claims**



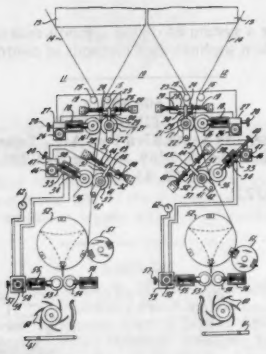
Books (magazines) are compiled from signatures demographically in that persons in the same mailing zone may

receive books with signatures of different content. The books are trimmed while superimposed one on another, but nonetheless proper mailing sequence (zone separation) is maintained by shifting a trailing book forward to lie atop the next leading book just before trimming, and then the shifted book is returned to its former position before being mailed thereby to preserve the mailing zone sequence.

3,608,889
AUTOMATIC NIPPING AND FOLDING ROLLER CONTROL SYSTEM

Richard Woessner, Fairlawn; Jack Bryer, Paramus, N.J., and Ralph L. Fusco, Commack, N.Y., assignors to Wood Industries, Inc., Plainfield, N.J.

Filed Apr. 9, 1969, Ser. No. 814,668
Int. Cl. B65h 45/16
U.S. Cl. 270—76 **6 Claims**

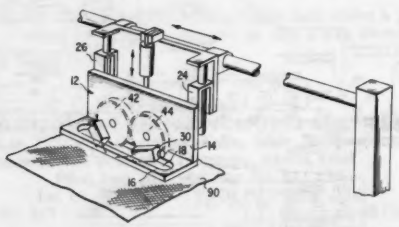


A newspaper-printing machine folder has two pairs of nipping rollers and one pair of folding rolls. The rollers of each pair are held against one another under the pressure force of a spring or the like elastic means. The setting of the position of the rollers is adjustable according to the thickness of the product to be folded. Additional pressure force balancing devices are provided on the rollers. Sensing elements are arranged for detecting of differences of the roller pressure, controlling the motive power-operated adjusting devices for resetting the roller position to the originally set force.

3,608,890
LIMP MATERIAL PICKUP DEVICE

William W. Littlefield, El Paso, Tex., assignor to Automatic Systems of America Inc., El Paso, Tex.

Filed Sept. 24, 1969, Ser. No. 860,587
Int. Cl. B65h 3/22
U.S. Cl. 271—21 **7 Claims**

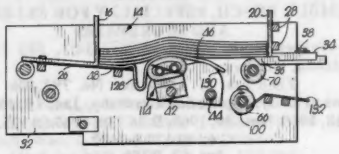


A device designed to lift a single ply of flexible sheet material from a stack. A pair of meshing gears rotatably mounted upon a support each carry an impaling means mounted on its periphery extending in converging relationship towards each other. A fluid motor mounted upon the support is drivingly connected through a crank arm to one of the gears, which upon actuation, will rotate one of the gears driving the other. Rotation of the gears causes the impaling means to move downwardly towards a stack of sheet material which can be positioned therebeneath, to penetrate and grasp therebetween, in a pinching or bunching motion, a single ply of said material from the stack. The fluid motor has its piston linearly adjustable in a slot formed in the crank arm, wherein the throw of the crank arm can be varied to finely adjust the amount of rotation of the gears, which in turn adjusts the depth of penetration or downward movement of the impaling means, so that the device will pick up only a single ply of material regardless of variations in thickness of material in different stacks.

3,608,891
MECHANISM FOR SUCCESSIVELY DELIVERING SHEET ARTICLES FROM A STACK THEREOF TO A FOLDING MACHINE

Warren W. Hannon, and Charles N. Hannon, both of 925 Grand Ave., Olathe, Kans.

Continuation-in-part of application Ser. No. 665,540, Sept. 5, 1967, now abandoned. This application Aug. 7, 1968, Ser. No. 751,011
Int. Cl. B65h 3/30
U.S. Cl. 271—23 **15 Claims**



Bottom delivery feeders are employed in conjunction with a newspaper folding and wrapping machine and serve to sequentially feed sections of a newspaper into the machine for collation with the main body of the newspaper. One, two or three of such feeders of varying design may be used with the folding and wrapping machine in various operational configurations, depending upon the nature of the sections to be collated with the main newspaper.

One feeder embodiment is particularly adapted to feed multileaved newspaper sections from a stack thereof. A hopper receives the stack of newspaper sections, a shelf beneath the stack being utilized to support the trailing edge portion of the lowermost section. A pair of stationary fingers supports the leading edge portion and feeding is effected from the bottom of the stack by a plurality of oscillatory grippers which frictionally engage the lowermost section and withdraw the leading edge portion thereof from between the next to the lowermost section and the support fingers. The trailing edge portion of the lowermost section is then withdrawn by pinch rollers which receive the leading edge portion upon return movement of the grippers as the same are continuously oscillated to provide sequential feeding. In a modified form of this embodiment, a single, reciprocable support finger is employed and is particularly adapted for use in the feeding of thin supplements with a hard edge at the fold only.

A second feeder embodiment is particularly suited for the feeding of tabloid size sheets which require folding prior to collation with the main newspaper. The same basic operational principles are employed in the withdrawal of the leading edge portion of the lowermost sheet from the hopper. However, continuously rotating grippers are used in conjunction with a roller against which force is applied by the grippers to pinch the loop (formed upon withdrawal of the leading edge portion) between the grippers and the roller to guide the same into a delivery conveyor that transports the withdrawn sheet in folded form to the folding and wrapping machine. The feeders of the first and second embodiments may both be mounted on the machine and used singly depending upon the nature of the paper to be fed. When the feeder of the first embodiment is in operation, the sections being fed therefrom are conveyed through the other feeder,

the operating components of the latter being adapted to assist in the conveying of the sections to the folding and wrapping machine. When it is desired to employ such other feeder to feed tabloid sheets to the machine, it operates in the normal manner and the first feeder is inoperative at this time.

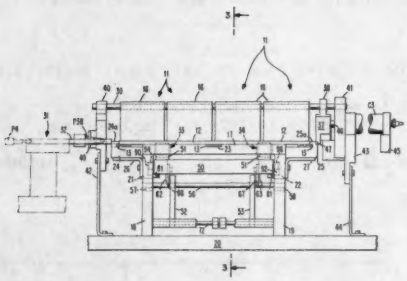
A top delivery feeder for sequentially delivering wrappers to the folding and wrapping machine operates in conjunction with either of the above feeders and employs a plurality of rotary grippers which are brought into frictional engagement with the uppermost wrapper of a stack thereof during each revolution of the grippers. The grippers are driven by a common shaft but are coupled with the shaft in a manner to permit the grippers to rotate ahead of the shaft free of the latter as each wrapper is advanced from beneath the grippers by a conveyor that receives the leading edge of each wrapper as it is fed from the stack.

3,608,892

ARTICLE-HANDLING MACHINE FOR USE WITH ELECTRONIC ASSEMBLIES

Ernest L. Newman, Owego, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 5, 1968, Ser. No. 750,226
Int. Cl. B65h *3/24*
U.S. Cl. 271—43 R **4 Claims**



A printed circuit card transfer machine comprises a transfer table, an unloading mechanism movable relative to the transfer table, and means for indexing a magazine loaded with printed circuit card assemblies along the transfer table to an unloading position. The transfer table has a top plate with apertures over which the magazine moves. The indexing mechanism is a horizontal frame located under the top plate and having feed teeth extendable upwardly through the apertures to engage the magazine. The feed frame is cycled through a square motion pattern by an oscillatable elevating mechanism and a reciprocating mechanism operated by pneumatic cylinders controlled by pilot valves for sensing the location of the feed frame and the condition of the unload mechanism. Cam means located on the transfer table and the feed frame provide a square motion guide path for the frame to precisely position the feed frame for engaging and holding card-holding channel of the magazine for feeding to the unloading position.

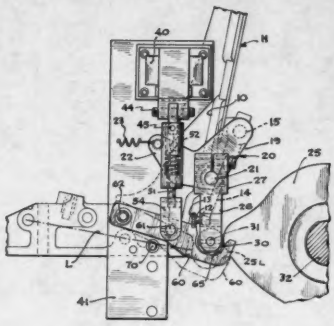
3,608,893

SIGNATURE FEEDERS

William B. McCain, Hinsdale, and John Balla, Argo, both of Ill., assignors to McCain Manufacturing Corp., Chicago, Ill.

Filed July 14, 1969, Ser. No. 841,493
Int. Cl. B65h *7/04*
U.S. Cl. 271—56 **5 Claims**

Improved operation of a cyclically operable signature gathering machine is achieved by latching the gripper, which feeds a signature from a hopper, against the signature pile in



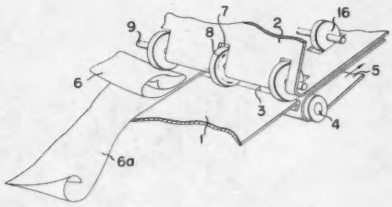
response to a command signal that signatures are not to be fed from the hopper.

3,608,894

ORIGINAL FEEDING DEVICE FOR PHOTOCOPYING MACHINE

Kenzo Ariyama, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Mar. 3, 1969, Ser. No. 803,711
Claims priority, application Japan, Mar. 6, 1968, 43/14052
Int. Cl. B65h *7/06*
U.S. Cl. 271—57 **3 Claims**



An original feeding device for a photocopying machine in which a plurality of resilient rollers carried by a common shaft and disposed in parallel with an original inserting inlet rotate in the same direction with that of the original feed direction when the leading edge thereof passes the rollers. But the rollers are caused to rotate in the direction opposite to said first direction after the leading edge has passed the rollers, thereby preventing the trailing edge of the original from being wound by the rollers.

3,608,895

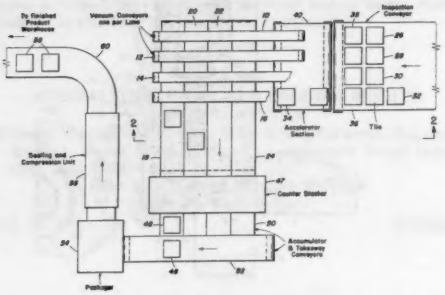
ELECTROPNEUMATIC FLAT PRODUCT SHUFFLING AND PACKAGING SYSTEM

Alex E. Kalven, Somerville, N.J., assignor to GAF Corporation, New York, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,138
Int. Cl. B65h *29/32*
U.S. Cl. 271—74 **4 Claims**

As flat products such as floor tiles leave a production conveyor in transverse rows and longitudinal lanes, they are picked up by an accelerator conveyor travelling in the same direction under vacuum conveyors which lift the tiles and carry them over transverse conveyors which the tiles are selectively deposited by the operation of unique air pressure valves which act to positively break the vacuum supporting the tiles over selected ones of the transverse conveyors, so as to mix the tiles from different lanes, for subsequent packaging thereof. The air pressure valves are built into the vacuum housing associated with each vacuum belt, and each is pro-

vided with an air pressure inlet for breaking the vacuum supporting the tiles when a selected one is directly over the selected transverse conveyor. A control circuit provides for automatic operation of the air pressure valves in the desired sequence.

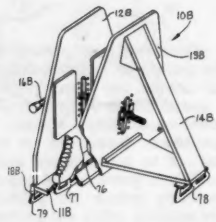


3,608,896

TRAINING DEVICES FOR BALLET AND ICE SKATING

Pierre Brunet, 15 West 55th St., New York, N.Y.

Filed July 10, 1968, Ser. No. 743,903
Int. Cl. A63b *23/04, 69/00*
U.S. Cl. 272—57 D **9 Claims**



An exercise and training device for ballet and figure skating performers having pivotally interconnected front and rear panel members defining a narrow elongated slot therebetween for retaining the user's feet in oppositely extending directions, and screw means for adjusting the spacing of said front member relative to said rear member. Once properly adjusted, the performer may stand between said panel members and be snugly gripped thereby to facilitate bending backwardly and forwardly for loosening and strengthening various muscles of the body. Such exercising is further facilitated by the fact that the performer's feet may be moved laterally various distances during the exercising period.

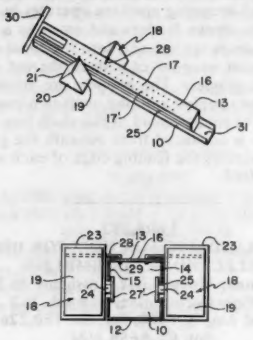
3,608,897

STARTING BLOCK ASSEMBLY

Francis James Ross, Winnipeg, Manitoba, Canada, assignor to Topper Mfg. Co., Ltd., Winnipeg, Manitoba, Canada

Filed Apr. 14, 1969, Ser. No. 815,664
Int. Cl. A63b *69/00*
U.S. Cl. 272—59 A **1 Claim**

A starting block apparatus including an elongated frame having longitudinal slots on opposite sidewalls thereof and a row of apertures on the top side thereof extending the full length of the frame. Foot-engaging blocks are disposed adjacent their respective slots and each including a protruding stud and web engageable within the slots for longitudinal movement therealong. The slots are wider than the protruding studs to enable the block to be raised and lowered therein and to further enable a locking hook mounted on the block to be selectively positioned within the various apertures.

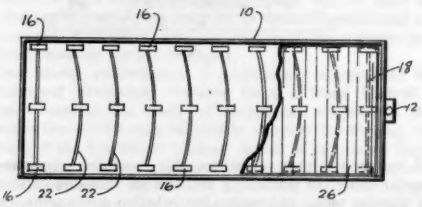


3,608,898

TREADMILL WITH CURVED AXLES SUPPORTING THE BELT

Evan H. Berlin, 119 Dunn Ave., Lake City, Pa.

Filed May 19, 1970, Ser. No. 38,666
Int. Cl. A63b *23/06*
U.S. Cl. 272—69 **4 Claims**



A treadmill utilizing an endless belt which permits a user to run while remaining in one place. Curved axles supporting driving wheels are employed to minimize the number of driving wheels and axles employed. Each axle rotatably supports one wheel at its center and one wheel at each end. These axles are curved in a horizontal plane so that the center wheel is offset from the end wheels.

3,608,899

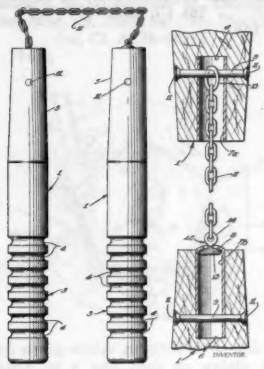
HAND WEAPON

William S. Hall, 237 Keck Ave., Aurora, Ill.

Filed Apr. 10, 1968, Ser. No. 720,319
Int. Cl. F41b *15/02*
U.S. Cl. 273—84 **3 Claims**

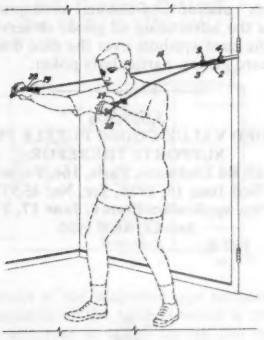
A hand weapon, generally similar in usage to a nightstick or baton, comprising two rigid elongated members, each connected to one end to the other by a nonrigid element such as a length of chain, whereby each member may swing relatively independent of the other, within the limitation imposed by the chain with respect to separation of the connected ends of said members, each member being provided with a hand-

gripping portion adjacent the free end thereof whereby one member may be grasped in each hand and utilized in



cooperation with each other, or either member may be grasped and the other member permitted to swing loosely.

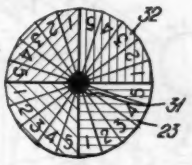
3,608,900
FRICTIONAL RESISTANT EXERCISING DEVICE
Harold Dee Welch, 532 E. William, San Jose, Calif.
Filed Apr. 9, 1969, Ser. No. 814,597
Int. Cl. A63b *21/00, 21/16*
U.S. Cl. 272—79 A **7 Claims**



An exercise device in the form of a bracket utilized in conjunction with a rope doubled back upon itself to form a bight engaging one end of the bracket. The strands of the rope immediately adjacent the bight are twisted to provide a plurality of helical turns extending generally the length of the bracket. The opposite end of the bracket is arranged to guide the separate strands of the rope so that tension applied to one or the other of the strands effects longitudinal sliding movement of the rope to create frictional resistance between the contiguous strands. The amount of such frictional resistance is controlled by the number of helical turns into which a portion of the rope is twisted, and the amount of tension applied to the rope strands.

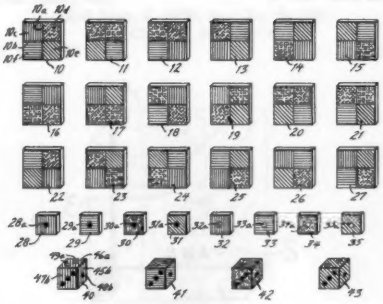
3,608,901
SIMULATED GOLF BOARD GAME
William H. Royle, Mayfield Park, Rhodesia, assignor to Entertainment Service (Private) Limited, Salisbury, Rhodesia
Filed Mar. 6, 1968, Ser. No. 711,088
Claims priority, application Rhodesia, Mar. 8, 1967, 84/67
Int. Cl. A63f *3/02*
U.S. Cl. 273—134 CG **4 Claims**

A board game adapted to simulate the game of golf includes at least one game board depicting one or more, and preferably 9 or 18, holes in a golf course, pin markers adapted to be positioned on said board and to protrude above said board for recording the lie of a golf ball thereon, chance means for selecting coordinate indicia for determining a possible golf shot and a plurality of different indicator means each representing a different golf club and each adaptable to interpret a golf shot of the chance means onto said board. Each indicator means has a datum aperture for receiving a pin marker therethrough to pivotally position said club-designating indicator means on the board in a manner permitting proper alignment positioning. In one form the



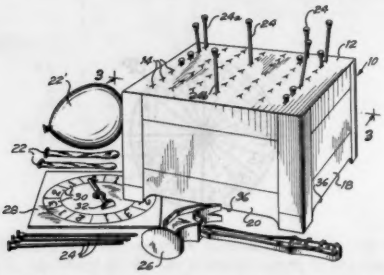
club-designating indicator means may have the form of transparent fan-shaped protractorlike members having a plurality of arcuately and radially dispersed holes therein related to the aperture datum for potentially locating by a pin marker on the board a lie for a golf shot determined from the chance selected coordinate indicia. Other forms of the indicator means include either a single elongated (putter) member or a pair of such limblike members pivotally connected at one of their ends for varying angular relation for a golf shot and having a plurality of points related to the aperture datum for establishing potential golf shot lies by the use of pin markers, as determined from the coordinate indicia.

3,608,902
CUBE GAME
Joseph A. Weisbecker, 1220 Wayne Ave., Erlton, Cherry Hill, N.J.
Filed Dec. 10, 1969, Ser. No. 883,918
Int. Cl. A63f *3/02, 9/06*
U.S. Cl. 273—134 AD **2 Claims**



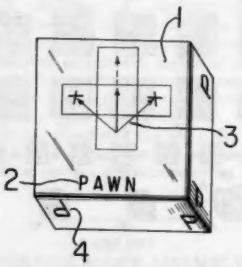
A game construction wherein a playing surface is marked to provide a plurality of congruent, contiguous squares, and playing pieces are provided, each being of cubical configuration with its faces each congruent to the playing surface squares for aligned superposition on a respective square and selective rolling into aligned superposition on a contiguous square, the playing piece faces and the playing surface squares being provided with characteristic markings of corresponding form, and the playing piece face markings being one or more in number.

3,608,903
GAME BOX ENCLOSING INFLATED BALLOONS
Julius Cooper, New Hyde Park, and Walter Moe, Plainview, both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.
Filed Nov. 19, 1969, Ser. No. 878,134
Int. Cl. A63f 9/00
U.S. Cl. 273—135 R 5 Claims



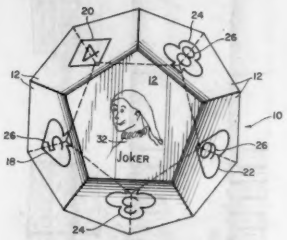
A toy game apparatus and playing pieces including an opaque box with an open bottom and with the top thereof providing a playing surface having precut nail-receiving perforations. The game progresses with balloons being placed within the confines of the opaque box and each child in turn, attempting to drive one or more nails through the playing surface without bursting a balloon. The precut perforations are shaped and formed in a construction making the playing surface and the perforations indefinitely reusable. A spinner is provided with the game, the spinner surface having indicia thereon to indicate, after spinning the spinner dial, the number of nails the child playing with the toy game must attempt to drive through the playing surface during his turn without bursting a balloon.

3,608,904
SET OF CHESS PIECES
Desmond W. Margetson, 515 West 122nd St., New York, N.Y.
Filed June 18, 1968, Ser. No. 738,011
Int. Cl. A63f 3/00
U.S. Cl. 273—137 R 1 Claim



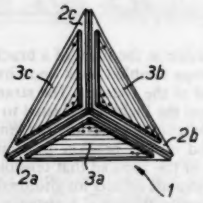
A chess set comprising reversible pieces which are squares of about the same size as the squares on the playing board, the said pieces having on one side the name and symbol of the piece and on the opposite side the name and move of the piece, and on each lateral side two relatively inverted indicia thereon facing in opposite directions, the thickness of the piece being substantially less than its width, and said indicia consisting of the first letter of the name of the piece, one indicia being upright no matter which face is up.

3,608,905
FIVE DODECAHEDRON CARD INDICIA DICE
Robert W. Edison, 1212 Walnut, Berkeley, Calif.
Filed Dec. 18, 1968, Ser. No. 784,664
Int. Cl. A63f 9/04
U.S. Cl. 273—146 6 Claims



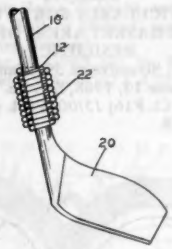
A set of dice utilizing five die each having the shape of a dodecahedron with twelve flat surfaces. Symbols representing the face and number cards of a standard 52 card deck of playing cards are distributed over the surface of the dice and displayed thereon. Each die displays at least 10 and at most 11 of the symbols, and the latter are distributed so that the symbols of a particular suit on one die vary in their value by at least five increments while the four remaining dice have a similar distribution except for one combination. Additionally, the dice may have the symbols distributed so that no die has two symbols of the same value but different suits. Surfaces of the dice not having card symbols display markings which can be "wild cards" and/or may further serve promotional purposes such as the advertising of goods or services. This distribution of the card symbols over the dice enables the playing of many card games, particularly poker.

3,608,906
MULTISIDED VALUE-CODED PUZZLE PIECES AND SUPPORTS THEREFOR
Marc Odier, 85 Bd Ehelmans, Paris, 16e, France
Filed June 15, 1970, Ser. No. 45,971
Claims priority, application France, June 17, 1969, 6920254
Int. Cl. A63f 9/06
U.S. Cl. 273—157 R 16 Claims



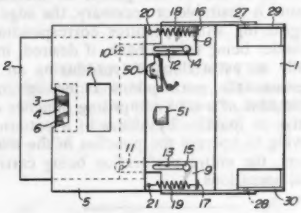
A puzzle is provided in which identical planar multiside puzzle pieces carrying a value taken from M possible values at each one of its apices. A support which is preferably a polyhedron is provided and has portions adapted to receive the pieces such that the completed puzzle formed by the pieces arranged on the portions of the polyhedron is substantially that of the polyhedron. According to the preferable rules of the puzzle, the pieces are to be placed on the support in such a manner that in each of the groups of juxtaposed apices, the value carried by each apex is the same as that carried by each of the other apices juxtaposed thereto. Further, the number of puzzle pieces is preferably limited so that all the combinations of M values taken N by N are produced once and only once by the number pieces.

3,608,907
GOLF CLUB INCLUDING HEAD-WEIGHTING STRING ENCASED IN PLASTIC SHEATH
George E. Bouchard, 59 W. Schuyler St., Oswego, N.Y.
Filed Mar. 28, 1968, Ser. No. 716,932
Int. Cl. A63b 69/36
U.S. Cl. 273—194 A 1 Claim



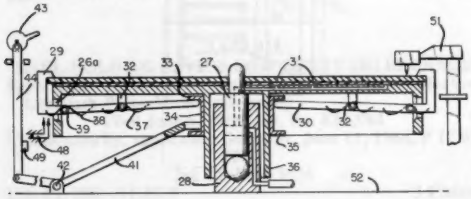
Plastic coated string solder adapted to be spirally wrapped around the shank of a golf club to weight the same as desired. The plastic coating may be heat shrunk about the string solder to close off the ends.

3,608,908
TAPE-VIEWING DEVICE IN MAGNETIC TAPE RECORDER OF MAGAZINE TYPE
Kozo Yamamoto, Hirakata-shi, and Morihisa Naito, Moriguchi-shi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Japan
Filed Mar. 8, 1968, Ser. No. 711,673
Claims priority, application Japan, Mar. 15, 1967, Apr. 12, 1967, 42/22330;42/31269
Int. Cl. G11b 5/78, 19/12
U.S. Cl. 274—4 E 2 Claims



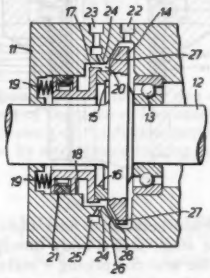
A tape recorder of the magazine type adapted to operate with a tape magazine of the kind in which a magnetic tape supplied from one reel is taken up on the other, having means through which the interior of the tape recorder body, hence the relative amount of the tape on the reels within the magazine can clearly be seen only when the magazine is inserted into the tape recorder body.

3,608,909
RECORD-FLATTENING TURNTABLE
Jacob Rabinow, 6920 Selkirk Drive, Bethesda, Md.
Filed Nov. 3, 1969, Ser. No. 873,314
Int. Cl. G11b 3/60
U.S. Cl. 274—39 R 4 Claims



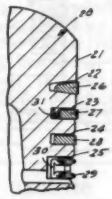
A phonograph record turntable is provided with means for flattening disc records placed thereon. Examples are shown for accomplishing this by means of vacuum or mechanical holddown devices.

3,608,910
SHAFT SEAL ARRANGEMENTS
Stanley R. Tyler, Cheltenham, England, assignor to Dowty Fuel Systems Limited, Cheltenham, England
Filed Oct. 29, 1969, Ser. No. 872,178
Claims priority, application Great Britain, Oct. 31, 1968, 51670/68
Int. Cl. F 16j 15/00
U.S. Cl. 277—15 4 Claims



A seal assembly for use with a rotatable shaft has a sealing ring axially loaded against a flange portion of the shaft, a number of orifices directing fluid for cooling and lubrication radially inwardly against the sealing ring, and a scavenge pump having an impeller which is formed by a part of the flange disposed radially outwardly of the sealing ring, and which operates during rotation of the shaft to return the fluid to the source and to maintain low fluid pressure adjacent the sealing ring. When applied to the shaft of a fuel pump, the foregoing arrangement is used to seal a lubricated part of the shaft which is supported in bearings, while a second seal engages the part of the shaft adjacent the pump, the space around the shaft between the two sealing rings being vented.

3,608,911
RESILIENT PLASTIC PISTON RING
Herbert F. Prasse, Town and Country, and Harold E. McCormick, Ballwin, both of Mo., assignors to Ramsey Corporation, St. Louis, Mo.
Filed Mar. 4, 1970, Ser. No. 16,278
Int. Cl. F16j 9/00, 9/20
U.S. Cl. 277—58 14 Claims



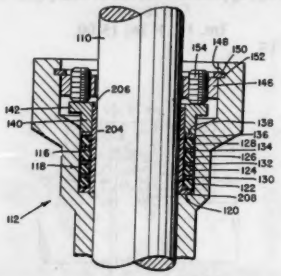
A plastic ring for internal combustion engine pistons. In a preferred embodiment, the ring has a flat outer diameter adapted to engage the inner diameter of a compression piston ring and an inner diameter adapted to engage the backwall of the ring groove. An axial groove slightly spaced from the outer diameter extends into the ring from the top thereof, whereby combustion gases will expand the ring so that it acts as a circumferential expander for the compression ring while preventing blowby of gases through the ring groove. In another modification, the ring is used with its outer diameter acting against the cylinder wall.

3,608,912

SEALING MEANS FOR VALVE STEMS

Paul D. Templin; William G. Sonderman, and Russell G. Smith, all of Cincinnati, Ohio, assignors to Xomox Corporation, Cincinnati, Ohio

Filed Nov. 4, 1969, Ser. No. 873,804
Int. Cl. F16j *15/18*
U.S. Cl. 277—123 14 Claims



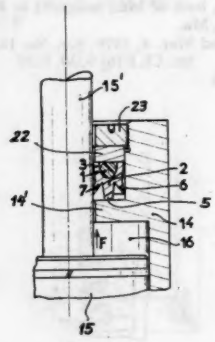
A seal is formed between a liner sleeve, which surrounds part of a valve stem, and a body through which the valve stem extends, the seal comprising a plurality of O-rings with annular spacers therebetween always out of contact with the valve stem. The inner diameter of each of the annular spacers is greater than the outer diameter of the liner sleeve, so that there is no firm engagement therebetween, and each of the O-rings makes four-point contact with the spacers adjacent thereto, the body, and the liner sleeve, to produce a series of annular-spaced sealing zones.

3,608,913

GLAND FOR PISTON-CYLINDER ASSEMBLY AND THE LIKE

Andre D'Assignies, Saint-Etienne, France, assignor to Industrial Development Company Establishments, Vaduz, Liechtenstein

Filed Nov. 20, 1969, Ser. No. 878,333
Claims priority, application France, Nov. 22, 1968, 50663
Int. Cl. F16j *15/37*
U.S. Cl. 277—165 10 Claims



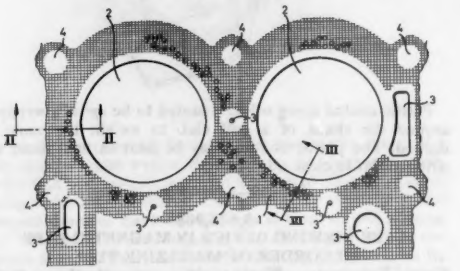
A fluid cylinder traversed by a piston rod has a peripheral recess formed between two axially spaced, relatively adjustable annular members. Clamped within this recess is an annular gasket of relatively stiff elastic material having on one face an annular rib abutting against one of these members and bearing through a membranelike central zone of the gasket upon a resilient ring of more readily deformable material lodged in a groove flanked by two annular beads on the opposite gasket face. The rib is flanked by a pair of annular lips separated from it by respective annular incisions and facing in the direction of fluid pressure, one lip bearing upon the piston rod while the other rests against the peripheral wall of the recess; the beads flanking the groove form integral extensions of the two lips to compress the deformable ring between them upon a splaying of the lips.

3,608,914

GASKET, PARTICULARLY FOR CYLINDER HEADS, COMPRISING GASKET AREAS OF GRADUATED RESILIENCY

Eigil Brandt Harby, Strandvejen 39, Klampenborg, Denmark

Filed June 13, 1968, Ser. No. 736,609
Int. Cl. F16j *15/00*; F16k *41/00*
U.S. Cl. 277—235 B 4 Claims



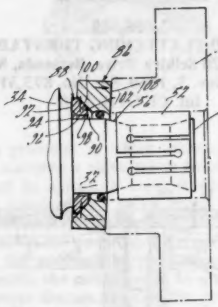
A sealing gasket is disclosed comprising essentially a layer of elastic sealing material and a layer of reinforcing material, e.g., a metal sheet, this sheet being perforated with a great number of small holes located in relation to each other with a varying density in such a manner that said density is lowest in the areas where, in use of the gasket an increase in the specific pressure is desirable or necessary, the edge of gasket apertures registering with apertures corresponding for instance to cylinder being folded back, if desired, in order to provide locally an extra thickness producing an increased specific pressure, the perforations being advantageously produced by means of a tool comprising punches optionally rendered active or inactive by means of a patterned platen provided serving to operate the punches in the manner of a Jacquard loom, the entire perforation being carried out in one or several operations.

3,608,915

FLOATING END STOP FOR WORK-HOLDING CHUCK

George Hohwart, Farmington, Mich., assignor to N. A. Woodworth Company, Ferndale, Mich.

Filed June 2, 1969, Ser. No. 829,203
Int. Cl. B23b *31/40*
U.S. Cl. 279—1 L 11 Claims



A work-holding chuck having a novel end stop comprising front and rear beveled washers, the front washer being mounted for universal rocking movement on a spherically

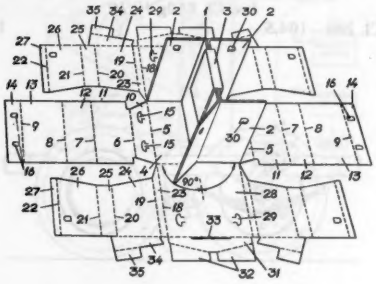
curved annular seating surface of the rear washer to adapt to the seating end of the workpiece and the rear washer being freely laterally shiftable to accommodate rocking of the front washer.

3,608,916

ERECTABLE U-SHAPED ARTICLE

Jaakko Tauno Aleksis Halko, Helsinki, and Paavo Tapio Pennanen, Inkeroinen, both of Finland, assignors to Oy Tampella AB, Inkeroinen, Finland

Filed Mar. 21, 1969, Ser. No. 809,151
Int. Cl. A47c *9/12, 4/02*
U.S. Cl. 297—440 **7 Claims**



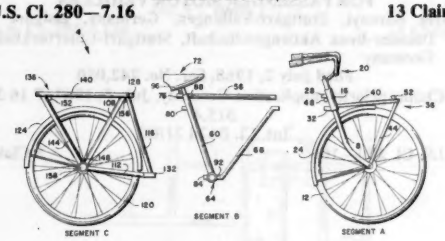
An erectable item of furniture which is assembled from an initially flat sheet and a juxtaposed support is provided comprising a pair of hollow sidewalls, an end wall formed of hollow sections extending between the sidewalls and a shelf formed by a center wall portion extending between the sidewalls.

3,608,917

COLLAPSIBLE BICYCLE

Joseph A. Cogliano, 1268 Maple Ave., Baltimore, Md.

Filed Aug. 14, 1969, Ser. No. 850,187
Int. Cl. B62k *13/00*
U.S. Cl. 280—7.16 **13 Claims**



A collapsible bicycle is disclosed which can be made into or converted into various tandem or coupled arrangements. The basic collapsible bicycle contains a front steering and wheel unit, a central seat and pedaling unit and a rear wheel unit.

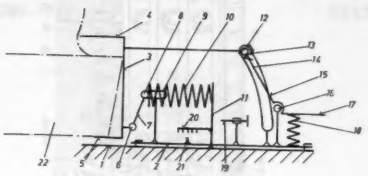
3,608,918

HEEL-HOLDING DEVICE FOR SAFETY SKI BINDINGS

Egon Heckl, Farchant, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany

Filed June 6, 1969, Ser. No. 830,984
Claims priority, application Germany, June 11, 1968, P 17 03 569.7
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **3 Claims**

A pivoted carrier is biased by a spring element and carries a sole holder and a closing pedal and in response to the insertion of the skiing boot into the binding automatically assumes a locked position. From this position it can be swung to a heel-releasing position arbitrarily, e.g., by a slight pressure applied with the ski stick to a release member, or automatically in response to an excessive force which is approximately vertically upwardly directed. Two separate pivotal axes are



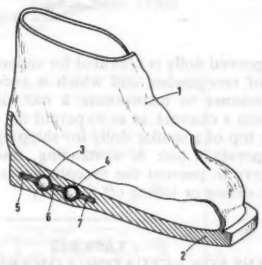
provided for the opening of the device, one of which is for the arbitrary opening of the device. The other pivotal axis is for the automatic opening of the device carrier which is held in operative position by a releasable locking member.

3,608,919

SKI BOOT AND SKI BINDING THEREFOR

Paul Lollmann, and Justus Rieker, both of Tuttlingen, Germany, assignors to Rieker & Co., Tuttlingen, Württemberg, Germany

Filed Jan. 31, 1969, Ser. No. 795,550
Claims priority, application Germany, Feb. 27, 1968, P 16 78 289.1
Int. Cl. A63c *9/08*
U.S. Cl. 280—11.35 R **12 Claims**



A ski boot in which one or more tubular elements are firmly embedded in the sole into which the skier himself may install at least partly spherical locking elements of a ski binding which are adapted to engage resiliently into spherical apertures or recesses in bracketlike fittings which are adjustably secured to the ski. The ends of the tubular element or elements are flush with the peripheral edge of the sole and may be closed by plugs if the skier wishes to employ a different ski binding.

3,608,920

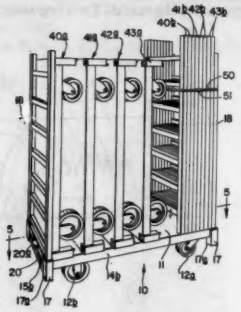
CART STORAGE ASSEMBLY

Richard J. Rubin, 39 Dolphin Road, Newton, Mass.

Continuation-in-part of application Ser. No. 789,131, Dec. 16, 1968. This application Sept. 16, 1969, Ser. No. 858,342
Int. Cl. B62d *39/00*
U.S. Cl. 280—33.99 **7 Claims**

A cart storage assembly including one assembled cart which includes a substantially horizontal platform member, rollers for moving it along the floor and a pair of opposite end members extending upwardly from the platform member, a plurality of detached end members supported on the platform of the assembled cart in substantially parallel relationship to each other and to one end member of the as-

sembled cart and a plurality of platform members detached from their end members, the detached platform members



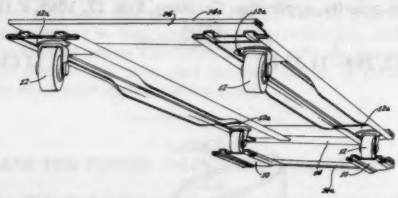
being supported on the platform of the assembled cart in substantially parallel relationship to each other and to one end member of the assembled cart.

3,608,921

DOLLY

James D. Wilson, Long Beach, Calif., assignor to Banner Metals, Inc., Compton, Calif.

Filed July 25, 1969, Ser. No. 844,771
Int. Cl. B62b *5/00*
U.S. Cl. 280—79.1 **1 Claim**



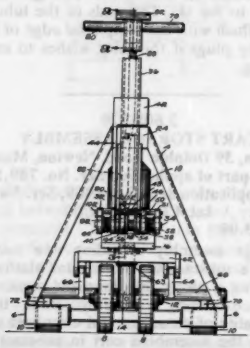
An improved dolly is provided for supporting, for example, a stack of receptacles, and which is constructed in an improved manner to incorporate a pair of side strips, each formed into a channel, so as to permit the dolly to be stacked easily on top of a similar dolly for shipping convenience, and to incorporate a pair of upstanding, transverse end strips, which serve to prevent the receptacles and the stacked dollies from sliding or rolling off the dolly.

3,608,922

MEANS FOR ACTUATING LOWERING VALVE IN HYDRAULIC HAND-OPERATED PALLET TRUCK

Erich Best, Welland, and Kenneth Booth, Sr., Fonthill, both of Ontario, Canada, assignors to Hyster Company, Portland, Oreg.

Filed Nov. 4, 1969, Ser. No. 873,820
Int. Cl. B62d *21/18*
U.S. Cl. 280—43.12 **11 Claims**



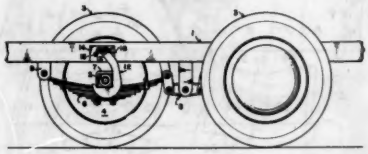
Mechanism whereby the operator of a hand-operated pallet truck can control the release of fluid from the hydraulic lifting cylinder without removing his hands from the truck handle and while both of his feet are on the ground. The mechanism comprises hand-operated means located at the end of the handle for applying a controlled opening movement to the lowering valve regardless of the position of the truck handle.

3,608,923

MEANS RESTORING AN AXLE TO HORIZONTAL POSITION UPON TIRE DEFLATION AT EITHER END THEREOF

William J. Houfek, Sr., 136 Fairway Drive, and William J. Houfek, Jr., Rt. 3, Box 1011, both of Albany, Oreg.

Filed May 29, 1969, Ser. No. 828,870
Int. Cl. B60g *19/10*
U.S. Cl. 280—104.5 **1 Claim**



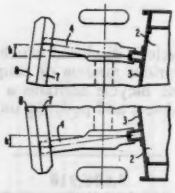
A device for selectively engaging and holding either end of an axle in a tandem axle and spring assembly to compensate for the lowering or dropping of that end of the axle due to deflation of its respective pneumatic tire. The device comprises a hook swingably depending from the frame or chassis of the vehicle and adapted for holding engagement with the axle after said end thereof has been jacked up or elevated to restore it to its normal horizontal position.

3,608,924

SAFETY FRAME FOR MOTOR VEHICLES, ESPECIALLY FOR PASSENGER MOTOR VEHICLES

Bela Barenyi, Stuttgart-Vaihingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed July 2, 1968, Ser. No. 742,050
Claims priority, application Germany, July 5, 1967, P 16 30 315.4
Int. Cl. B62d *21/00*
U.S. Cl. 280—106 **5 Claims**



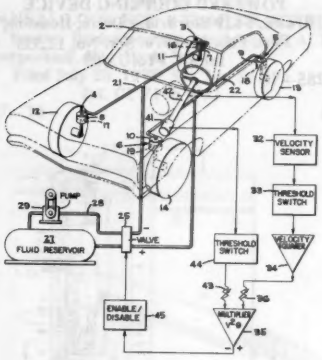
A safety frame for motor vehicles, particularly for passenger motor vehicles, which comprises crossbearers, lateral bearers extending longitudinally approximately within the wheel track and pronglike frame end members of the vehicle end sections which are spaced from each at a smaller distance than the spacing of the lateral bearers; the pronglike frame end members are supported essentially only at the main crossbearers and extend in a downward direction toward the respective vehicle ends.

3,608,925

APPARATUS FOR OFFSETTING CENTRIFUGAL FORCE AFFECTING MOTOR VEHICLES

Peter H. Murphy, 241 John St., Santa Cruz, Calif.

Filed May 7, 1969, Ser. No. 822,546
Int. Cl. B60g 21/10
U.S. Cl. 280—112 10 Claims



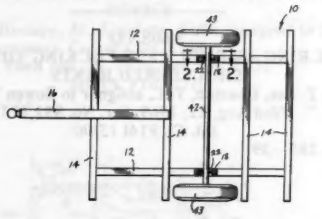
The invention is a suspension for motor vehicles and the like which adjustably controls the wheel height of the vehicle relative to the chassis during turns. Sensors convert vehicle turn angle and velocity information into electrical signals for initiating pressure changes in selected expansible springs for adjustably offsetting the centrifugal force occurring during turns.

3,608,926

SUSPENSION SYSTEM FOR AN AXLED VEHICLE

Lynn H. Sprunger, P.O. Box 78, Albion, Ind.

Filed Apr. 14, 1969, Ser. No. 815,812
Int. Cl. B60g 11/22
U.S. Cl. 280—124 4 Claims



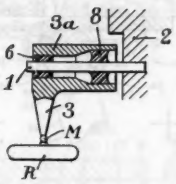
A suspension system for a vehicle having a frame which includes a pair of spaced longitudinal frame members. An upper bracket is secured to each frame member and has diverging downwardly extending end parts which project below the supporting frame member and which are positioned longitudinally of the vehicle. A lower bracket is spaced below each upper bracket and includes diverging downwardly extending end parts which are separated by an intermediate part and which underlie corresponding end parts of the adjacent upper bracket. Resilient means is disposed between and interconnects each pair of corresponding upper and lower bracket end parts. An axle extends transversely of the frame between the end parts of each lower bracket and is secured to the intermediate part thereof.

3,608,927

LONGITUDINAL-FLEXIBILITY WHEEL SUSPENSION

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automibiles Citroen, Paris, France

Filed Dec. 22, 1969, Ser. No. 887,081
Claims priority, application France, Dec. 27, 1968, 181,255
Int. Cl. B60g 3/12
U.S. Cl. 280—124 10 Claims



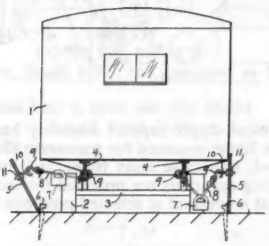
Longitudinal-flexibility suspension system for vehicle wheels comprising an arm adapted to oscillate about a fixed shaft disposed in a vertical longitudinal plane and rigid with the chassis of the vehicle, a first sleeve of elastomer mounted about said shaft and having a cylindrical outer surface formed with hollow cells spaced from one another and from the sleeve ends, said outer surface of the sleeve being in frictional contact with the inner surface of a first end of a hub while a second connecting means consists of a second sleeve of elastomer fitted on said shaft and formed with circular external projections in frictional contact with the inner surface of the other end of said hub.

3,608,928

TRAILER SKIRT

John D. Hooker, 309½S. Marina, Prescott, Ariz.

Filed May 15, 1970, Ser. No. 37,653
Int. Cl. B60r 27/00
U.S. Cl. 280—150 R 5 Claims



The trailer skirt comprises a plurality of panels arranged around the lower edge of the trailer for enclosing the space therebeneath. The panels are individually held in place against the trailer body at the top and against ground stops at the bottom by resilient, readily detachable means connected between the trailer frame and the panels. These resilient means may be in the form of either weights or springs, and are connected to the panels by a hook-and-eye connection whereby the panels may be removed by merely pulling the top edges away from the trailer body far enough to reach in and unhook the connection.

3,608,929

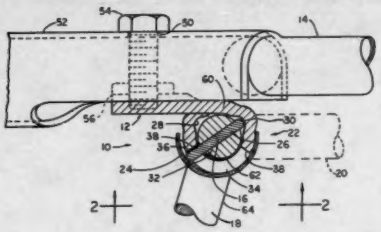
CYCLE KICKSTAND

Martin R. Baginski, Austinberg Township, Ashtabula, Ohio, assignor to Ashtabula Bow Socket Company, Ashtabula, Ohio

Filed July 23, 1969, Ser. No. 844,134
Int. Cl. B62h 1/02
U.S. Cl. 280—301 16 Claims

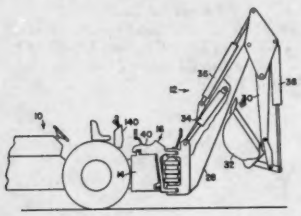
A cycle kickstand having a support leg which may be positioned in a cycle-supporting position or a storage position, includes a supporting member adapted to be secured to a cycle

frame. The support leg is rotatably supported by the support member for movement between the cycle-supporting position and the storage position. A detent mechanism is provided which positively positions the support leg with respect to the



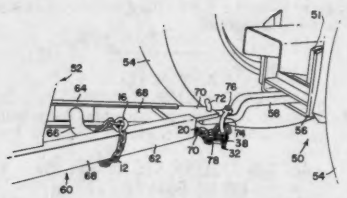
support member in the cycle-supporting position and the storing position. The detent mechanism includes a floating key which is slidably supported in an opening in the support leg. A spring urges the floating key into communication with one of the members.

3,608,930
HYDRAULIC CLAMPING APPARATUS FOR A SIDE-SHIFTABLE MECHANICAL DIGGER
Pierre Moriceau, Saran, and Yves Loranchet, Le Saumon, both of France, assignors to Deere & Company, Moline, Ill.
Filed Sept. 22, 1969, Ser. No. 859,755
Claims priority, application France, Apr. 15, 1969, 6911555
Int. Cl. B60d *1/00*
U.S. Cl. 280—456 **32 Claims**



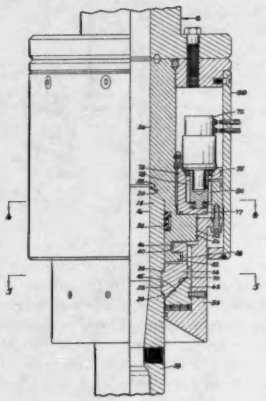
A mechanical digger support assembly has a boom-supporting slide frame mounted for transverse sliding on a tractor-supported, transverse main frame and hydraulically applied clamping apparatus are provided for securing the slide frame against movement at selected positions along the main frame.

3,608,931
HITCH SAFETY CHAIN
Arnold Burton Skromme, Moline; Dennis Albert Kerckhove, East Moline, Ill., and Donald Thomas Sorlie, Ankeny, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Dec. 15, 1969, Ser. No. 885,023
Int. Cl. B60d *1/12*
U.S. Cl. 280—457 **12 Claims**



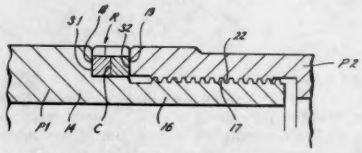
A hitch safety chain is provided for connection between towed and towing vehicles. The chain has a grabhook at one end and the grabhook includes a releasable latch for closing the throat of the hook portion to retain a link of the chain therein. At the other end of the chain is an enlarged passing or connecting link which may be either welded or bolted to a draft member of the towed vehicle or through which the grabhook may be passed to loop or wrap the safety chain about the draft member of the towed vehicle.

3,608,932
POWERED COUPLING DEVICE
Cicero C. Brown, 5429 Sturbridge Drive, Houston, Tex.
Filed Feb. 18, 1970, Ser. No. 12,333
Int. Cl. F16l *35/00*
U.S. Cl. 285—18 **6 Claims**



A powered coupling device for connecting massive tubular bodies, particularly at locations remote from the center of operations, as in connecting large diameter conduit or pipe to a subsea wellhead. The coupling device includes a pin member sealingly received in a box or socket member and power-driven latch elements for strongly securing the pin-and-box members together and to afford a metal-to-metal seal between the members to supplement a plastic seal between the members.

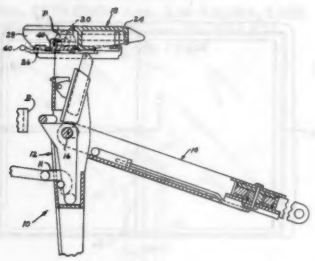
3,608,933
LOCK RING ASSEMBLY FOR LOCKING THREADED SHOULDERED JOINTS
William T. Lee, Houston, Tex., assignor to Bowen Tools, Inc.
Filed Aug. 22, 1969, Ser. No. 852,173
Int. Cl. F16l *15/00*
U.S. Cl. 285—39 **8 Claims**



A lockring assembly for resisting disconnecting torque in a threaded coupling for connecting adjacent pipes wherein such assembly includes a pair of circular members adapted to be positioned between opposed shoulders in the coupling and wherein the circular members have outer gripping surfaces for gripping the opposed shoulders when the threaded connection is tightened together. The circular members also in-

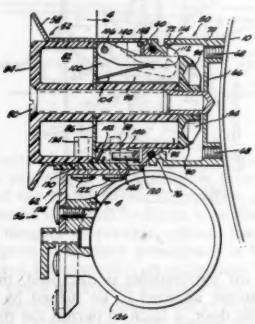
clude interengaging cam surfaces which mesh together upon such tightening and which urge the pipes axially apart as they are rotated in a disconnecting direction relative to each other to thereby resist such rotation. The invention also includes means for holding the circular members against rotation relative to each other to prevent such intermeshing cam surfaces urging the threaded joints axially apart to thereby avoid interference with loosening and disconnecting such pipes.

3,608,934
MANUAL LOCK FOR A TRAILER HITCH
Richard P. Yeates, Bridgeton, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed July 20, 1970, Ser. No. 56,296
Int. Cl. F16b *9/02*
U.S. Cl. 287—20 **6 Claims**



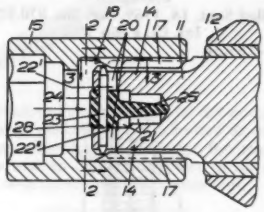
A hitch, particularly of the tractor-operated type for supporting a trailer on a railway car, has a pair of jaws adapted to clamp the upper portion of a trailer kingpin, and an additional manual locking device for holding the kingpin in the trailer supporting plate of the hitch. The manual locking device includes a locking plate located beneath the kingpin and pivoted to the supporting plate and extending forwardly of the kingpin. The forward end of the locking plate has an upturned ridge or wall. A locking handle supported on the bottom of the supporting plate is adapted to slide forwardly to engage the bottom of the locking plate and move it upwardly. In this position the upstanding wall on the locking plate is juxtaposed to the lower portion of the kingpin to prevent it from moving out of the supporting plate.

3,608,935
HELMET MOUNTED DISPLAY UNIT WITH FASTENER DEVICE
Edward W. Hodapp, Jr., Gardena, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Jan. 28, 1970, Ser. No. 6,631
Int. Cl. F16d *1/10*
U.S. Cl. 287—23 **2 Claims**



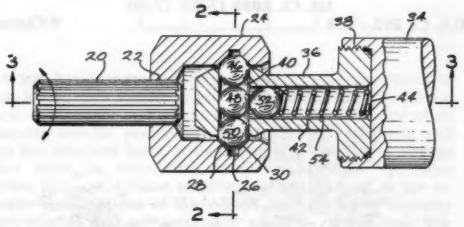
Helmet-mounted, electro-optical display unit with fastener device for mounting and demounting of the display unit. Special design of the fastener device allows simple, quick operation thereof by the human hand to effect detachment of the unit from the helmet.

3,608,936
SOCKET-RETAINING MEANS FOR SPLINED DRIVE SHAFTS
Karl Gosta Karden, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Dec. 5, 1968, Ser. No. 781,362
Claims priority, application Sweden, Dec. 8, 1967, 16877/67
Int. Cl. F16d *1/06*
U.S. Cl. 287—53 **11 Claims**



A retaining means for retaining a socket element on a splined drive shaft end by way of locking cooperation between the outer extremity of a retaining pin and an internal abutment on the splines of the socket element, the retaining pin being movably journaled in a transverse guide passage in the shaft end transversely of the shaft end and transversely of itself between a retaining position in which the outer extremity of the retaining pin is disposed within the axial extension of one of the grooves of the shaft end and a release position in which the outer extremity of the retaining pin is disposed within the axial extension of a spline on the shaft end.

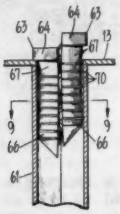
3,608,937
COUPLING DEVICE
William E. Nave, South Bend, Ind., assignor to The Bendix Corporation
Filed May 4, 1970, Ser. No. 34,283
Int. Cl. F16b *7/00*
U.S. Cl. 287—119 **9 Claims**



A coupling device for connecting rotatable and pivotable relatively movable first and second members wherein an annular member fixedly secured to one of the relatively movable members is provided with an annular recess or bearing race in the inner wall thereof. A shaft portion of the other MEMBER extends into the cup-shaped portion and is provided with a diametrical bore having oppositely disposed spherical bearing elements which are urged outwardly from the diametrical bore into seating engagement with the annular recess or race by an intermediate spherical bearing element urged between and into alignment with the oppositely disposed bearing elements to secure the first and second

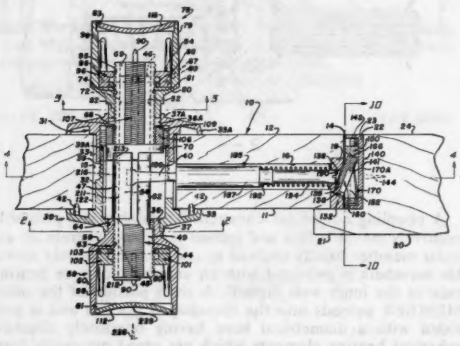
members together. The intermediate spherical bearing element is engaged by and held in position by a spring-loaded spherical bearing element disposed in an axial bore which intersects the diametrical bore. The first and second members are prevented from pulling apart by the aligned spherical bearing elements in the diametrical bore which permit relative rotation of the first and second members and/or relative pivotal movement thereof on an axis passing through the aligned spherical bearing elements.

3,608,938
INTERLOCKING RAILING CONSTRUCTION
Robert H. Murdock, Oakland, Calif., assignor to Railtec Corporation, Berkeley, Calif.
Division of Ser. No. 644,505, Aug. 30, 1967, Patent No. 3,498,589.
Filed Sept. 18, 1969, Ser. No. 870,937
Int. Cl. F16b *5/00*
U.S. Cl. 287—189.36 9 Claims



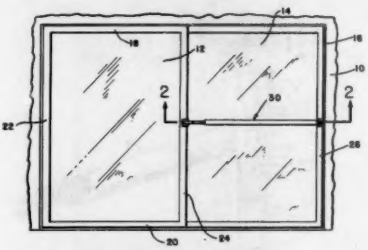
An interlocking construction for metal railings is described which provides a rigid and tamperproof railing construction and yet which is quickly assemblable. The interlocking construction includes a wedge-and-hanger assembly for rigidly securing locking bars for an upper rail to railing posts. A connector is also provided for securing a bottom rail to the posts by a wedge arrangement which assures tight securance of the bottom rail to the posts. Bars are arranged vertically between the upper and lower rails and are secured thereto by locking studs which rely upon a friction fit to assure tight securance of the bars.

3,608,939
CONVERTIBLE LATCH SET
Stuart G. McBurnie, Burnaby; William G. Fortt, Port Coquitlam, and Michel L. E. Rocher, Vancouver, all of British Columbia, Canada, assignors to Velto Industries Ltd., Vancouver, British Columbia, Canada
Filed Sept. 17, 1969, Ser. No. 858,630
Int. Cl. E05b *15/02, 13/00*
U.S. Cl. 292—254 9 Claims



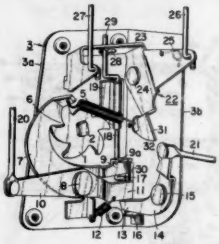
A latch set having a locking slide which is movable from a disengaged position, in which a latch mechanism can be actuated by rotation of either door handle, to an engaged position, in which the latch set and therefore the door are locked. The locking slide is adjustable relative to associated parts whereby the latch set can selectively be installed as either a privacy set which will lock the door, or as a passage set which will merely latch but not lock the door, with either one of the alternate installations being adapted for later conversion to the other.

3,608,940
SLIDABLE DOOR SAFETY LOCK
Francis B. Mueller, 4917 Chase Ave., Downers Grove, Ill.
Filed Oct. 30, 1969, Ser. No. 872,574
Int. Cl. E05c *17/04*
U.S. Cl. 292—262 11 Claims



A sliding door security lock of telescoping members limited in movement in a contracted direction, one end being attached to the frame of the sliding door itself and the other end being attached to the doorjamb or a second door in the doorjamb. Both attachments are releasable, one by retracting one member from one member when the door is closed and the other by angularly moving the other member when the one member is retracted therefrom. The one member is latched by a pivoted coaxial keeper in its telescoping position and the latch is held closed by the other member when the door is open.

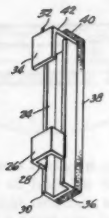
3,608,941
DOOR LOCK FOR AUTOMOBILES
Tsukane Kondo, Yokohama, and Kishiro Muroi, Sagamihara, both of Japan, assignors to Ohi Seisakusho Co., Ltd., Yokohama, Japan
Filed Apr. 7, 1969, Ser. No. 814,143
Claims priority, application Japan, Apr. 10, 1968, 43/23571
Int. Cl. E05c *19/06, 3/06*
U.S. Cl. 292—280 6 Claims



A door lock for automobiles is disclosed, the door lock comprising a ratchet adapted to be turned by the opening and closing of the door, a latch to permit the rotation of the ratchet in the direction where the door is closed and obstruct the rotation of the ratchet in the direction where the door is opened. Levers are provided each controllable by the outside handle or the inside handle and means are interposed

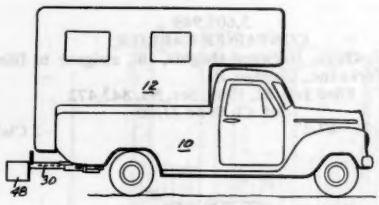
between the levers and the latch to disengage the latch from the ratchet when either lever is operated with the outside handle or inside handle. Locking means are further provided, these locking means being adapted to be operated with the inside knob or by a key, the locking means, when in the locked state, preventing transmission of the motion or turning due to manipulation of either of the outside handle or inside handle to the latch and, when the door is shut without using the outside handle, the locking means being coupled to the latch wherein the movement of the latch due to the turning of the ratchet shifts the lock to the unlocked state and further, when the lock is fastened and the door is closed while manipulating the outside handle, the door can be closed without a key.

3,608,942
BUMPER DEVICE
Joseph L. Telles, 1570 Blake Ave., Los Angeles, Calif.
Filed July 25, 1969, Ser. No. 844,825
Int. Cl. B60r *19/08*
U.S. Cl. 293—65 **1 Claim**



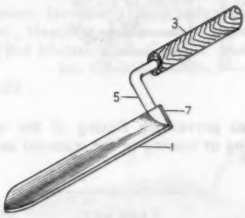
A bumper device including a pair of rubber-covered blocks with a U-shaped bracket connected to one end thereof and an outwardly extending and downwardly extending member having an L shape connected to another end thereof for attaching the blocks to the tow plate of a tow truck.

3,608,943
EXTENSIBLE AUTOMOBILE BUMPER
Frank T. Gostomski, 246 West Eighth St., Wahoo, Nebr.
Filed June 2, 1969, Ser. No. 829,463
Int. Cl. B60r *19/02, 27/00;* **B61f** *19/04*
U.S. Cl. 293—73 **8 Claims**



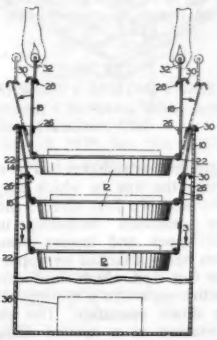
A bumper extension construction is disclosed comprising plate hangers adapted to be detachably secured to the opposite sides of the frame of an automobile and to depend therefrom. Spaced U-shaped brackets have their legs welded to said plate hangers to provide spaced, longitudinally extending passageways. In each passageway a bumper arm is slidably mounted for extension or retraction. Spring-loaded, wedge-shaped catch means are provided so a selected extension can be maintained without the use of bolts or tools, thus eliminating any looseness of parts during travel in forward and reverse directions. Also, spring-loaded wedges are provided to eliminate mechanical rattles between the bumper arms and the frame means forming the longitudinal passageways for the reception of said bumper arms.

3,608,944
MORTAR TROWEL
William V. Turner, 2800 Stanwix Lane, Richmond, Va.
Filed May 14, 1969, Ser. No. 824,401
Int. Cl. E04g *21/20*
U.S. Cl. 294—3.5 **1 Claim**



A trowel is disclosed characterized by the novel features of elongated blade of uniform width from end to end, a curved blade bottom, an offset handle and other features adapted to enable the operator to conveniently lay down a long, thin bead of mortar with minimum wrist movement.

3,608,945
ARTICLE-HOLDING ASSEMBLY FOR USE WITH AN OPEN-TOP CONTAINER
Charles T. Heitz, 7200 S. E. 92nd Ave., Portland, Oreg.
Filed Mar. 20, 1969, Ser. No. 808,816
Int. Cl. A47j *45/00*
U.S. Cl. 294—27 **1 Claim**

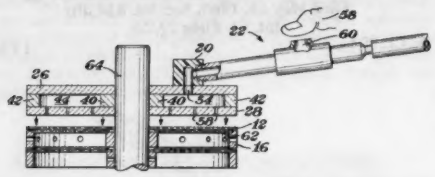


A tray having a pair of upright arms pivotally connected at their lower ends thereto. Each arm has an outwardly turned hook at its upper end adapted to engage the top edge of an open-top can for suspending the tray in the can. Each arm also has inturned hook at its upper end adapted to engage other trays for suspended connection thereto. The arms further have cross frame members for engagement by the inwardly turned hooks of other trays for suspending one tray from another in a container. The assembly may include one tray or a number of the trays one above the other in parallel relation. The trays have apertures therein allowing movement of heat, steam of liquid therethrough.

3,608,946
DEVICE FOR HANDLING OF A FILTER MEMBRANE
Edward D. Erickson, Arvada, and Robert L. Wilson, Boulder, both of Colo., assignors to The Dow Chemical Company, Midland, Mich.
Filed Nov. 19, 1968, Ser. No. 776,934
Int. Cl. B66c *1/02*
U.S. Cl. 294—64 **4 Claims**

A vacuum-operated tool useful for removing a filter medium, such as a filter membrane or disc, from its package and

for subsequently seating the membrane on a horizontal plate filter. The tool eliminates direct manual handling of the

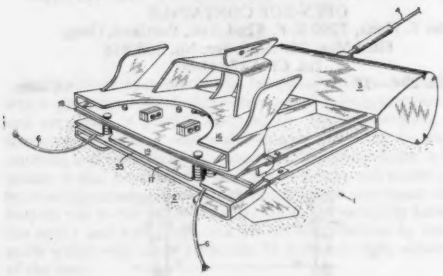


membrane, thus preventing flexing of the membrane and possible cracking or tearing of the material as a result of the flexing.

3,608,947
APPARATUS FOR RETRIEVING OCEANOGRAPHIC CABLE FROM THE SEA BOTTOM

Charles S. Mundy, Boulevard, and Fred Noel Spiess, La Jolla, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed June 22, 1970, Ser. No. 48,244
Int. Cl. B63c 7/06
U.S. Cl. 294—66 **7 Claims**



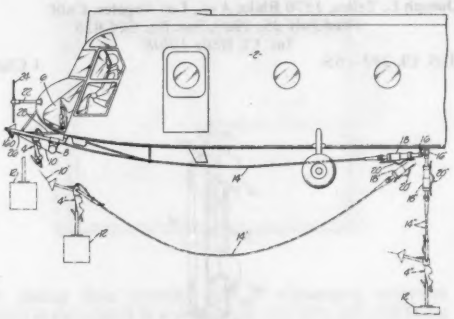
Lost oceanographic instruments can be recovered by locating and retrieving the line to which they are attached. A cable grabber formed of a four-layered sandwich presently is employed, the sandwich including upper and lower plowheads and upper and lower spring-loaded pressure plates, the plates being attached by upper and lower mounting braces to a tow sled which itself can be towed in any manner. The entire apparatus is symmetrically formed to permit an upside down operation. The pressure plates are resiliently maintained in a spaced disposition, while the plowheads include plowshares to dig into the bottom sediment and guide a trapped cable section into the space between the plates. The sled itself is free-flooding to improve stability. The resistance of a trapped cable to the pull of the sled causes the pressure plates to wedge together and clamp about the cable. Breakage of the cable is avoided by minimizing bending and by using a spring arrangement that exerts a controlled clamping force.

3,608,948
TACTICAL CARGO HOOK

Giles Arthur Kendall, Tarzana, and Robert Minick, Glendale, both of Calif., assignors to Menasco Manufacturing Company, Burbank, Calif.

Filed Apr. 3, 1968, Ser. No. 718,531
Int. Cl. B66c 1/12
U.S. Cl. 294—78 **21 Claims**

A cargo hook system having a drogue which may be supported on the nose of a helicopter; a cargo hook assembly and a probe supported from the cargo hook assembly, said cargo hook assembly having a hook movable from an open to a closed position, and means to maintain the hook in an unloaded condition in a direction facing toward the probe, means to position the hook in any desired direction when supporting a load, means to open and close the hook, means to lock the hook in its closed position when loaded, and latch means to prevent removal of a load from said hook in its closed position; support means for the cargo hook assembly which may be connected to a helicopter at or near its center of mass; and means to guide the probe into the drogue, to maintain the probe in the drogue when the cargo hook assembly is not in use, and to release the probe from the drogue when the cargo hook assembly is in use. A cargo hook assembly having a support housing; a hook supported by the housing and being rotatable with respect thereto; the hook having an open and a closed position; means to open and close the hook; means to lock the hook in its closed position when supporting a load; means to bias the rotational direction of the hook to a predetermined position with respect to the support housing; means to position the hook in any desired rotational direction with respect to the support

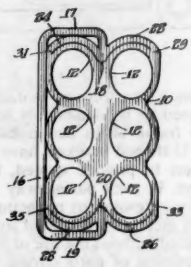


housing when supporting a load; and a latch means to prevent removal of a load from the hook in its closed position. A pickup adapter having a plurality of frame member connected pivotally in a sequential end-to-end relation; the endmost frame members connected to load support means; means biasing the frame members to maintain the unloaded adapter in a collapsed condition in which one of the frame members having a curved and a straight portion has its straight portion in a substantially horizontal position to provide a target area for the engagement of a hook; the frame members forming an inverted V-frame structure when the adapter is loaded, the load being supported by a hook which engages the horizontal straight portion of the said frame member having a curved portion, the hook sliding upwardly to the curved portion of the member as the adapter forms an erect inverter V-frame structure under load conditions.

3,608,949
CONTAINER CARRIER

Ronald C. Owen, Harwood Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

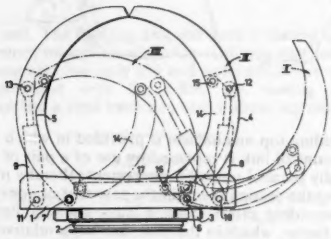
Filed July 22, 1969, Ser. No. 843,472
Int. Cl. B65d 71/00
U.S. Cl. 294—87.2 **2 Claims**



A container carrier blank formed from a flat sheet of resilient material and having a plurality of sockets for receiv-

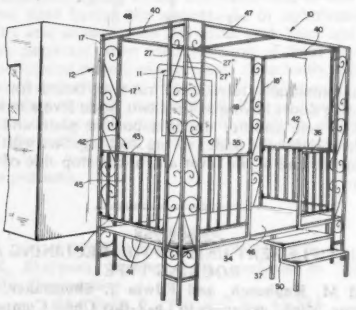
ing and gripping the central portion of a plurality of containers. A handle is joined to the body member of the carrier at opposing ends thereof and is so shaped as to be substantially resiliently displaceable transverse to the plane of the body member.

3,608,950
ARRANGEMENT AT LOAD CARRIER
Karl-Ivan Westbrand, Ornskoldsvik, Sweden, assignor to Ostbergs Fabriks AB., Alfta, Sweden
Filed Oct. 10, 1969, Ser. No. 865,253
Claims priority, application Sweden, Oct. 11, 1968, 13732/68
Int. Cl. B66c *1/42*
U.S. Cl. 294—88 3 Claims



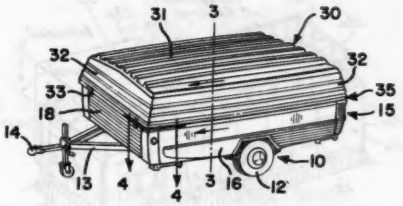
A load carrier comprises two grip arms pivotally mounted at their lower ends and so foldable from and towards each other that they overlap one another, each grip arm having a link mounted thereon at a point spaced from the axis of rotation of the arm. The other ends of the links are mounted slidably along paths each extending from the vicinity of the axis of rotation of the associated arm and directed substantially to the axis of rotation of the opposite arm, the respective paths for said other ends of the two links so extending side by side that when the grip arms swing together the links intersect one another providing a four-corner gripping space.

3,608,951
TRAILER PORCH
Samuel Thomas Jackson, 819 Stokes St., Danville, Va.
Filed Feb. 4, 1970, Ser. No. 8,522
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 6 Claims



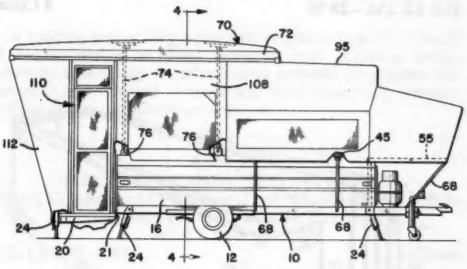
A readily assembled porch includes a rear unit positioned against a mobile home or the like and comprising a pair of vertical columns permanently connected by upper and lower crossmembers. A front unit is spaced outwardly from the rare unit and similarly comprises vertical columns permanently interconnected by crossmembers and the ends of the rear and front units being detachably connected by side rail members and upper and lower crossmembers. A panel member extends between the rear and front units and lower cross members to define a floor and a roof is formed by a panel extending across the upper ends of the rear and front units.

3,608,952
CAMPING TRAILER
Robert G. Simmer, Hamilton, Ohio, assignor to Ward Manufacturing, Inc., Hamilton, Ohio
Filed Mar. 4, 1970, Ser. No. 16,390
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 6 Claims



A camping trailer has a wheel-supported body, extendible beds and a collapsible cover including a substantially rigid plastic roof with a depending peripheral skirt. A framelike metal trim member is clamped on a curved lower edge portion of the skirt and provides for sliding movement of the skirt relative to the trim member in response to thermal expansion and contraction of the roof. The trim member also includes an inner portion to which flexible wall material is uniformly secured and provides spaces at the corners to permit free expansion and contraction of the roof.

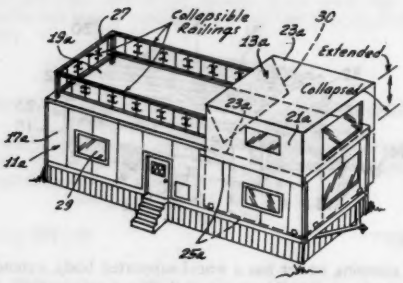
3,608,953
COLLAPSIBLE CAMPING TRAILER
Albert Stevens Bernard, Cincinnati, Ohio, assignor to Ward Manufacturing, Inc., Hamilton, Ohio
Filed Mar. 5, 1970, Ser. No. 16,673
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 12 Claims



A wheel-supported boxlike body supports a front bed and two side beds for movement between corresponding retracted positions overlying the body and corresponding extended positions projecting outwardly from the front and sidewalls of the body. The body has a rear wall which pivots to a horizontal open position forming an extension of the floor of the body at a lower level, and a utility console is movable from within the body rearwardly onto the rear wall in its open position. A rigid top is movable between a collapsed position overlying the beds and body and an elevated position covering the open rear wall and a rearward portion of the body. Canvas is supported by a tubular frame to form an extension of the top member and covers the beds in their

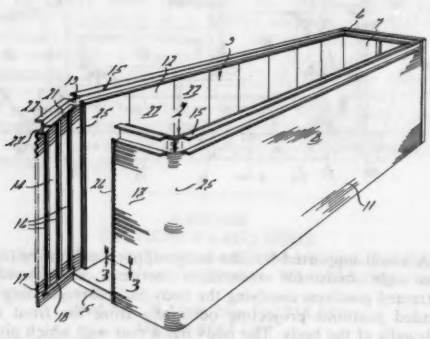
extended positions. The canvas continues downwardly to form sidewalls which attach to the beds and the rear wall in addition to the body.

3,608,954
COLLAPSIBLE VEHICULAR STRUCTURE
Orland R. Lynd, 940 Larch St. Apt. 6, Inglewood, Calif.
Filed May 16, 1969, Ser. No. 825,221
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 **9 Claims**



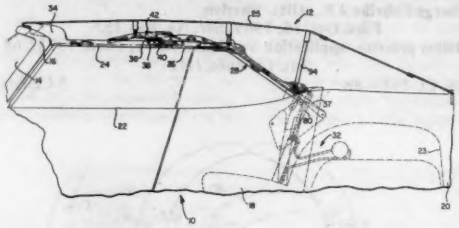
This disclosure describes a collapsible vehicular structure which includes a vehicular cabin having a peripheral sidewall and an upper wall and a cabin extension having a peripheral sidewall and a roof. The cabin extension is mounted on the vehicular cabin with the peripheral sidewalls thereof being telescopically interrelated to thereby provide a collapsible second story for the vehicular cabin.

3,608,955
METHOD OF MAKING TRUCKS, TRAILERS AND THE LIKE
Keith W. Tantlinger, Grosse Pointe Shores, Mich., assignor to Fruehauf Corporation
Filed Jan. 9, 1967, Ser. No. 608,101
Int. Cl. B62d *33/00*
U.S. Cl. 296—28 M **4 Claims**



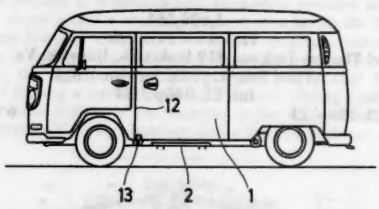
A trailer body has a platform to which two independent built-up side and front sections of the opposite hand are attached to the rear doorframe and the front and side edges of the platform and to each other by an upright extending upwardly from the platform centrally of the front edge thereof.

3,608,956
FOLDING TOP MECHANISM FOR CONVERTIBLE-TYPE AUTOMOBILE
Joseph Adamski, Brooklyn, Mich., assignor to Dura Corporation, Oak Park, Mich.
Filed June 2, 1969, Ser. No. 829,178
Int. Cl. B60j *7/12*
U.S. Cl. 296—117 **7 Claims**



A folding top mechanism is provided in which the conventional control link is replaced by use of a pair of side-by-side generally parallel rear rail components thereby materially increasing the seating space in the rear seat of convertible vehicles providing clean interior lines thereby improving the safety factor, which in the past, has been relatively lower for convertible automobiles than for metal top vehicles, and also increasing the rigidity of the mechanism in the extended position.

3,608,957
RUNNING BOARD FOR VEHICLES
Ernst Maneck, Wolfsburg, Germany, assignor to Volkswagenwerk AKG, Wolfsburg, Germany
Filed June 25, 1969, Ser. No. 836,232
Claims priority, application Germany, July 2, 1968, P 17 55 862.2
Int. Cl. B60r *3/00*
U.S. Cl. 296—146 **6 Claims**

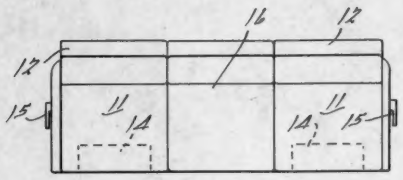


An automatically retractable running board for vehicles with sliding doors having at least two guide levers mounted in parallel to one another under a bottom plate and a lever movable horizontally under spring load together with a driver engaging the end of the lever and at the stop side of the sliding door.

3,608,958
MULTIPLE SEAT UNIT OF THE RECLINING AND ROCKING TYPE
Edward M. Knabusch, and Edwin J. Shoemaker, both of Monroe, Mich., assignors to La-Z-Boy Chair Company
Filed Aug. 4, 1969, Ser. No. 847,330
Int. Cl. A47c *1/02, 3/02*
U.S. Cl. 297—69 **10 Claims**

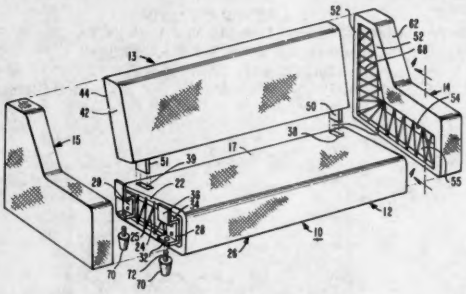
The multiple seat unit of a rocking or reclining type chair employs linkage mechanism therefor and for the leg rest which is similar to that used in a single unit chair construction. Some modification is required to the unit and mechanisms when two or more seating areas are provided for supporting the mechanisms between the side and center member of the unit. The end seating areas of a unit have tilt-

ing backs, movable seats and adjustable leg rests which operate independently of each other. The rocking type of multiple seating unit is a single construction which may be retained from rocking by locking it in tilted position at each



side of the unit. The rocking unit will have a seating capacity for two or more occupants while the reclining unit for a plurality of occupants has only the end units which are reclinable and provided with leg rests, the seating portion therebetween has a rigid back and seat without leg rests.

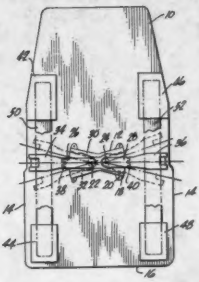
3,608,959
FURNITURE UNITS
Maynard C. Sarvas, 4773 Dogwood, Seal Beach, Calif.
Filed July 17, 1969, Ser. No. 842,639
Int. Cl. A47c *4/42, 4/02*
U.S. Cl. 297—218 **11 Claims**



A furniture unit is provided which can be shipped in disassembled condition and readily assembled and which has firmly attached, tightly fitting but removable covers while at the same time having the appearance of upholstered furniture. The unit incorporates individual seat, back and sidearm portions. Separate cover units for each of these portions include peripheral restraining elements detachably maintaining the covers under tension, the restraining elements being out of sight when the unit is assembled. The seat portion incorporates back support apertures within which mating members of the back portion register and are retained, and also includes side brackets for receiving and supporting the sidearm portions.

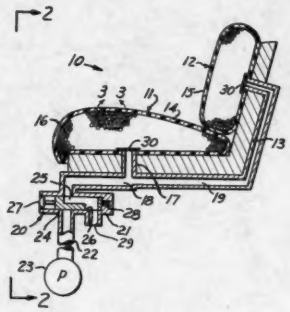
3,608,960
ADJUSTABLE BACK SUPPORT
Gale K. Sherman, Tustin, Calif., assignor to McDonnell Douglas Corporation
Filed Sept. 3, 1970, Ser. No. 69,374
Int. Cl. A47c *7/46*
U.S. Cl. 297—284 **7 Claims**

A back support in which a change in contour is provided not only in the front to rear plane but also vertical adjustment is provided to match the contour of the back of the seat occupant. Two arms are attached to a mounting plate secured to the seat back structure behind the cushion. These arms have outer end supports which pivot in a horizontal plane from front to rear to vary the "wrap-around" curvature of the back support. The arms also are tiltable vertically to adjust the contour to fit. Vertical resilient stays are provided within the seat cushion adjacent the hinged arms to spread



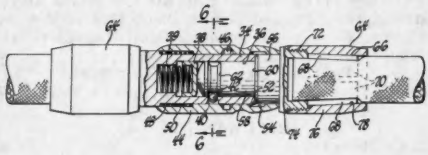
the cradling effect on the cushion over a satisfactory distance.

3,608,961
VARIABLE CONTOUR CUSHION
Robert Von Heck, 3205 Udall St., San Diego, Calif.
Filed Sept. 4, 1969, Ser. No. 855,144
Int. Cl. A47c *3/00*
U.S. Cl. 297—284 **12 Claims**



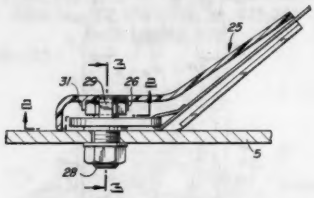
A cushion comprising a plurality of plastic beadlike material sealed within a pliant covering and including means whereby a user may selectively alter ambient air pressure differential and cushion contour and neutralize body pressure fatigue points for maximum comfort.

3,608,962
SAFETY BELT AND COUPLING DEVICE
Hillery G. Knecht, 552 Kinglsey Trail, Bloomfield Hills, Mich.
Filed Aug. 19, 1969, Ser. No. 851,219
Int. Cl. B60r *21/10*
U.S. Cl. 297—385 **8 Claims**



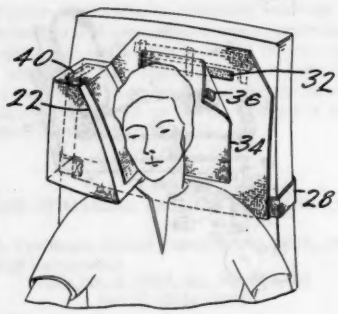
A safety belt of soft round braided rope with a coupling which includes male and female parts having ball wedging snap-lock interengagement therebetween and are under the control of an outer-disposed reciprocal sleeve member.

3,608,963
BOOT
Frank W. Steere, Jr., Akron, Ohio, assignor to Steere Enterprises Inc., Tallmadge, Ohio
Filed May 19, 1969, Ser. No. 825,614
Int. Cl. A62b 35/60
U.S. Cl. 297—385 3 Claims



Boots for seat belts which boots are slit from the top to the bottom so that they can be placed on a belt after it is attached to a vehicle.

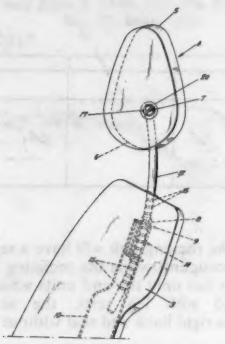
3,608,964
PILLOW FOR VEHICLE SEAT
Thad J. Earl, 1132 East Second St., Defiance, Ohio
Filed June 9, 1969, Ser. No. 831,380
Int. Cl. A47c 1/10; A47g 9/00
U.S. Cl. 297—397 1 Claim



A pillow unit for the head of a passenger in a vehicle seat is attached to the back of the seat and supports the head of the passenger and includes a base member or sheet attached to the seat with a pillow extending outwardly from the back a sufficient distance and at proper angle to support the head in a comfortable position. The base sheet is attached to the seat back by a lower elastic strap and by upper patches of Velcro or similar material which cooperate with other patches of Velcro on the seat back. In a preferred form, the pillow includes a cover and a removable pillow insert which can be removed for cleaning purposes.

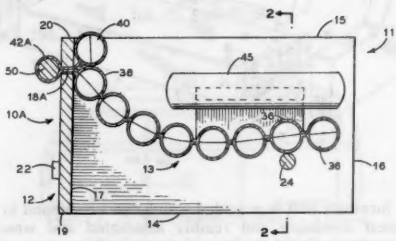
3,608,965
AUTOMOTIVE VEHICLE HEAD AND NECK REST
Kurt Cziptschirsch, and Gunter Dietz, both of Wuppertal-Barmen, Germany, assignors to Gebr. Happich G.m.b.H., Wuppertal-Elberfeld, Germany
Filed June 20, 1969, Ser. No. 835,013
Claims priority, application Germany, July 16, 1968, P 17 79 181.0
Int. Cl. A47c 7/36, 7/42
U.S. Cl. 297—410 8 Claims

Automobile seat headrest having a curved, approximately wedge-shaped in side cross section, cushioned body, with a narrow curved top edge and a wide curved bottom edge; supporting rods extending into the body and being connected thereto by pivot support means which permit pivoting of the headrest; a sector shaped insert in the cushioned body, through which the supporting rods pass, the walls defining the sector serving as the limit stops for the pivoting motion of the body; an auto seat includes a bushing for each supporting rod, which bushing has a break in the walls thereof to permit



the arms of a detent spring to mass through the walls and engage in one of the detent grooves on the supporting rod; the detent grooves face downward to impede downward headrest movement.

3,608,966
COLLAPSIBLE CHAIR
Peter Kredenser, 53 East 10th St., New York, N.Y.
Filed Feb. 17, 1969, Ser. No. 799,585
Int. Cl. A47c 27/08, 27/18
U.S. Cl. 297—454 9 Claims

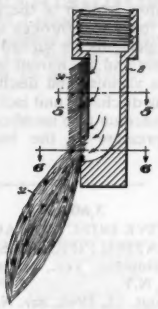


A collapsible chair construction having separably connected side and back frames together with a combination seat and back member separably suspended on the frames and including inflatable cushioning chamber portions, together with selected chamber portions for locking the seat and back member to the frames.

3,608,967
METHOD AND APPARATUS FOR FLAME WORKING MINERAL BODIES
John F. Vasselin, deceased, late of Nabnasset, Mass., by Herbert F. Vasselin, administrator, Westford, Mass., assignors to H. E. Fletcher Co.
Filed Apr. 21, 1969, Ser. No. 818,203
Int. Cl. E21c 37/16
U.S. Cl. 299—14 5 Claims

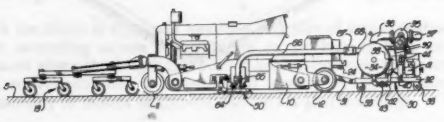
Flame cutting mineral bodies with an improved form of flame jet to produce spalling is employed to carry out a channeling operation wherein a vertical channel is cut in an exposed vertical face of granite in a quarry. Emission of a stream of products of combustion from a burner at superatmospheric pressure is controlled by means of a specially formed exit orifice in a flame jet nozzle to provide a jet flame which is distorted out of the normally conical shaped con-

figuration so as to provide a fan-shaped flame operative over a relatively extended area of impingement on a vertical face



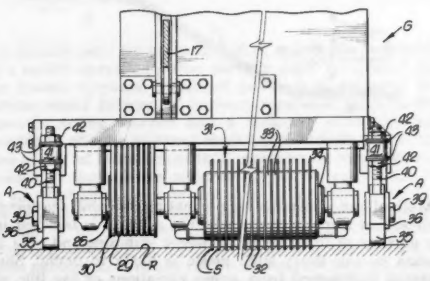
of stone with more efficient utilization of flame energy being realized in spalling.

3,608,968
PAVEMENT CUTTING AND WATER AND CUTTING PICKUP APPARATUS
Theodore Burnett, Orange, Calif., assignor to Christensen Diamond Products Company, Salt Lake City, Utah
Filed Apr. 3, 1969, Ser. No. 812,994
Int. Cl. E01c *23/09*
U.S. Cl. 299—39 **20 Claims**



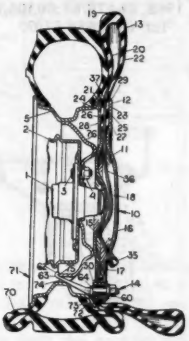
A concrete or other pavement planing, texturing and grooving machine embodying a vacuum pickup assembly located outside the perimeter of the groove-producing cutters, the cuttings being flushed away by water issuing from nozzles at the work region and producing a slurry with the cuttings, which slurry is sucked into the pickup assembly aided by ambient air also sucked from the pavement region into its confines. The air and water slurry mixture is drawn into a separating tank where the water slurry drops to the lower tank portion, the air being exhausted to atmosphere. The water slurry is pumped to a settling tank where the cuttings and water are separated and the clean water repumped to the nozzles located at the cutters.

3,608,969
APPARATUS FOR CONTROLLING INITIAL ENGAGEMENT OF CUTTERS WITH CONCRETE PAVEMENT SURFACES
Joseph B. Fowkes, Salt Lake City, Utah, assignor to Christensen Diamond Products Company, Salt Lake City, Utah
Filed Oct. 30, 1969, Ser. No. 872,494
Int. Cl. E01c *23/09*
U.S. Cl. 299—39 **24 Claims**



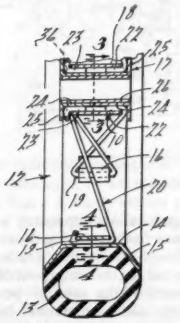
A tractor or wheel loader carries a grooving unit, including a gang of rotating saw blades, for cutting parallel grooves in a concrete pavement. A shock absorber device prevents the saw blades from being lowered rapidly to impact against the pavement and thereby possibly damage the blades. The shock absorber device is initially lower than the blades and contacts the pavement first, gradually retracting to permit gradual lowering and engagement of the saw blades with the pavement.

3,608,970
EMERGENCY WHEELS
William P. Strumbos, 85 Middleville Road, Northport, N.Y.
Filed Nov. 18, 1968, Ser. No. 776,332
Int. Cl. B60b *11/00*
U.S. Cl. 301—38 **13 Claims**



In the art of automotive emergency wheels that are used when a vehicle road tire has been punctured, an invention in which the emergency wheels used are of the type adapted to be mounted on the vehicle road wheel outboard of the damaged tire. The invention comprises a method for installing the wheel, and lightweight emergency wheels having narrow-section tubeless tires suitable for practicing the method. Preferred embodiments of the wheel used in the method incorporate as an integral part of the wheel disk a reservoir for pressurized fluid for inflating the tire. In the method, it is not necessary to jack up the vehicle to install the emergency wheel. In use, the emergency wheel, with its tire in the uninflated condition, is fastened on the vehicle road wheel outboard of the damaged tire. After the emergency wheel is fastened in place, its tire is inflated. This raises the vehicle off its damaged tire and into substantially its normal attitude such that it can be driven safely at reasonable speeds until repair facilities are reached. Also proposed in an emergency wheel construction in which a displacement of the sidewall produced by the inflation of the tire causes clamping means to be forced automatically over the vehicle road wheel rim such that the emergency wheel is clamped thereon pneumatically. A further embodiment uses the pressurized fluid utilized for inflating its tire to actuate the fasteners used to mount the wheel.

3,608,971
SPOKED WHEEL AND METHOD OF CONSTRUCTION
Paul F. Seibold, 26665 York Road, Huntington Woods, Mich.
Filed Apr. 4, 1969, Ser. No. 813,567
Int. Cl. B60b *1/04*
U.S. Cl. 301—58 **9 Claims**



A spoked wheel has a tired rim with U-shaped wire spoke elements having a web, two arms with outwardly extending

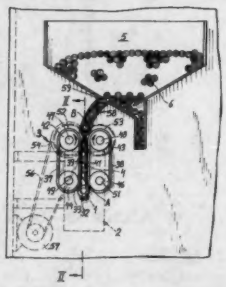
ends which are secured in spaced corrugations in a central hub section. The webs are secured in tongues struck inwardly from the central portion of the rim which tension the spoke elements when the tongues are forced outwardly.

3,608,972

TRANSFER APPARATUS FOR ROD-SHAPED ARTICLES

Willy Rudszinat, Dassendorf near Hamburg, Germany, assignor to Hauni-werke Korber & Co. KG., Hamburg, Germany

Filed Dec. 26, 1968, Ser. No. 786,932
Claims priority, application Great Britain, Feb. 9, 1968, Jan. 2, 1968, 06479/68;00306/68
Int. Cl. B65g *53/00*
U.S. Cl. 302—2 **36 Claims**



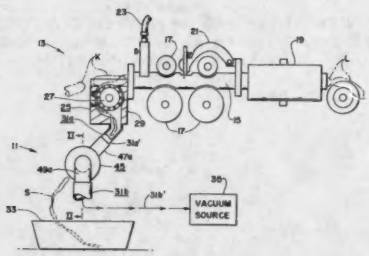
Apparatus for transporting filter rod sections or analogous rod-shaped articles comprises a pneumatic tube discharging a succession of articles which move lengthwise into one end of a channel defined by two walls at least one of which travels toward the other end of the channel to transport the articles sideways toward the inlet of a magazine. The width of at least a portion of the channel is slightly less than the diameter of an article.

3,608,973

SAUSAGE CASING DISCHARGE MEANS FOR LINK-SAUSAGE-PEELING APPARATUS

Thomas A. Klyce, Memphis, Tenn., assignor to Ranger Tool Co., Inc., Ellendale, Tenn.

Filed Jan. 30, 1969, Ser. No. 795,210
Int. Cl. B65g *53/00*
U.S. Cl. 302—2 **8 Claims**



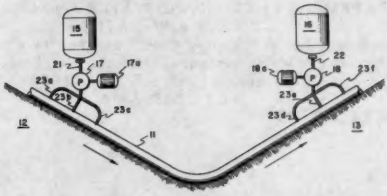
For use in sausage-peeling apparatus utilizing suction air pneumatic tube means for conveying meat-free casings of the sausages. The disclosed structure includes a vacuum wheel discharge unit adapted to be interposedly arranged in the pneumatic tube means of the sausage peeling apparatus for removing the sausage casing elements from the pneumatic tube while yet maintaining suction in the tube. The vacuum wheel casing discharge unit includes a cuplike power-driven vacuum wheel having a generally cylindrical perforated rim. Air under negative pressure is caused to flow radially inwardly into the hollow interior of the wheel and axially outwardly away from the wheel through the open side thereof; the sausage casing elements are sucked against the outside of the wheel by vacuum and are moved in an arc configuration to a position of no vacuum and discharged at atmospheric pressure. The casing discharge unit includes also vacuum seal means including a vacuum gate member for assisting in maintaining vacuum pressure in the interior of the casing discharge unit.

3,608,974

GELLING ADDITIVE INJECTION ARRANGEMENT FOR PREVENTING PIPELINE SLUMPING

Moye Wicks, III, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Sept. 23, 1969, Ser. No. 860,350
Int. Cl. B65g *53/30*
U.S. Cl. 302—14 **7 Claims**



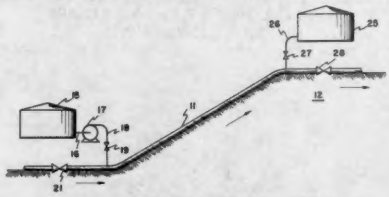
Method and apparatus for preventing downhill slumping in a shutdown slurry pipeline. Upon pipeline shutdown, a gelling agent is introduced into the slurry mixture to prevent the solid phase of the slurry from sliding downhill within the pipeline under the influence of gravity.

3,608,975

LIQUID INJECTION ARRANGEMENT FOR PREVENTING PIPELINE SLUMPING

Webster Morrill Sawyer, Houston; Erroll Vernon Seymour, Houston; Moye Wicks, III, Houston, Tex., and Lewis Philip Reiss, Denver, Colo., assignors to Shell Oil Company, New York, N.Y.

Filed Sept. 23, 1969, Ser. No. 860,351
Int. Cl. B65g *53/30*
U.S. Cl. 302—14 **8 Claims**



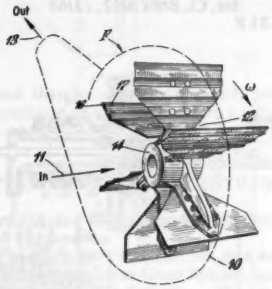
Method and apparatus for preventing downhill slumping in a shutdown slurry pipeline wherein a liquid is injected into the pipeline at those locations where slumping and plug formation by the slurry solid phase is likely to occur. Slurry material is removed from upper elevations of the line substantially simultaneously with the injection of the liquid.

3,608,976

FAN BLADE HAVING WEAR-RESISTANT RIBS AND FAN INCLUDING A PLURALITY OF SAME

Fines A. Zugelder, 335 Laramie Lane, Kokomo, Ind., and Ray K. Dehn, 2940 Galahad Drive, Indianapolis, Ind.

Filed Sept. 12, 1969, Ser. No. 857,525
Int. Cl. B65g 53/40
U.S. Cl. 302—37 8 Claims



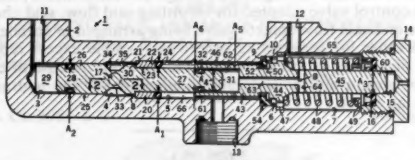
A fan blade is disclosed having a plurality of wear-resistant ribs extending across the width of its working surface and spaced along the length thereof for contacting solid particles, e.g. pulverized coal, to be propelled thereby. A fan including a plurality of blades as above-described is also disclosed.

3,608,977

CONTROL VALVE

Raymond J. Kersting, Dellwood, Mo., assignor to Wagner Electric Corporation, Newark, N.J.

Filed Oct. 7, 1969, Ser. No. 864,483
Int. Cl. B60t 8/26, 17/22, 11/34
U.S. Cl. 303—6 C 14 Claims



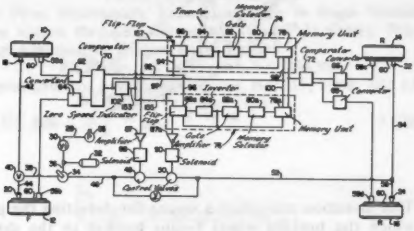
A control valve for use in a dual or split brake system having a switch-operating piston movable from a centered position toward opposed translated positions in response to a predetermined differential between separately supplied fluid pressures acting thereon and a metering piston normally movable to effect a metered application through said control valve of one of the supplied fluid pressures. A bypass passage is provided through the metering piston for connecting the one supplied fluid pressure and the applied fluid pressure in open pressure fluid communication to obviate the metering function of the metering piston, and the switch-operating piston is provided with a portion slidable in one end of the bypass passage to normally interrupt pressure fluid communication therethrough between the one supplied fluid pressure and the applied fluid pressure when said switch-operating piston is in its centered position.

3,608,978

ANTISKID BRAKE CONTROL

James C. Neisch, Warren, Mich., assignor to Rockwell-Standard Company, Pittsburgh, Pa.

Continuation of application Ser. No. 709,706, Mar. 1, 1968, now abandoned. This application May 1, 1970, Ser. No. 37,396
Int. Cl. B60t 8/08
U.S. Cl. 303—21 EB 9 Claims



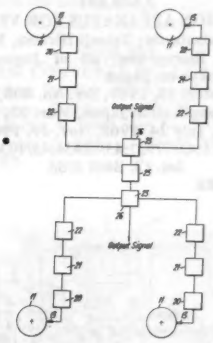
An automotive braking control system in which the rotational velocity of at least one of a set of wheels, usually the front wheels, provides a reference for comparison with the rotational velocity of at least one of another set of wheels to provide a signal to limit the braking effort at said other wheels, to a level just below that, which will cause said other wheels to lock up, except when said front wheels are first locked.

3,608,979

APPARATUS FOR INDICATING CHANGES IN ANGULAR VELOCITY, AND VEHICLE BRAKING SYSTEMS EMPLOYING SUCH APPARATUS

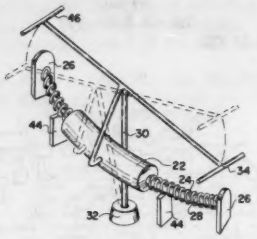
John Cadden Coyle, Wybunbury, near Nantwich, England, assignor to Rolls-Royce Limited, Derby, England

Filed Feb. 24, 1969, Ser. No. 801,538
Claims priority, application Great Britain, Mar. 6, 1968, 10,921/68
Int. Cl. B60t 8/08
U.S. Cl. 303—21EB 19 Claims



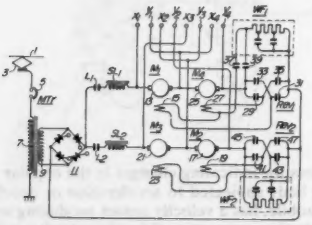
An apparatus for indicating changes in the angular velocity of a rotating body subjected to acceleration or deceleration, e.g. an automobile, has a velocity sensor producing an output having a frequency proportional to the angular velocity, a frequency-to-DC converter, a differentiator, a comparator for comparing the differentiated signal with a reference signal and for producing an output signal whenever the signals compared differ by a predetermined magnitude, which may be indicative of the onset of wheel-locking, and an actuator for reducing the deceleration (braking force) on the body in response to the comparator output signal.

3,608,980
ANTISKID AND ANTISPIN DEVICE
Walter S. Pawl, 2844 Powder Mill Road, Adelphi, Md.
Filed Feb. 25, 1969, Ser. No. 806,344
Int. Cl. B60t 8/12
U.S. Cl. 303—21 **2 Claims**



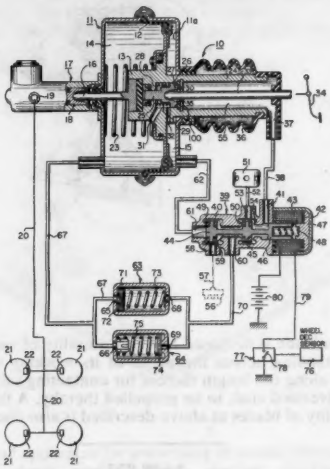
This invention comprises a means for detecting the point at which the braking wheel begins to skid or the driving wheel begins to spin, by using circumferential accelerometers mounted on the wheels to indicate the initiation of a skid or spin by an inertial displacement of each of the accelerometer weights as it passes the bottom of its rotation as the wheel starts to decelerate or accelerate its rotation faster than the resulting deceleration or acceleration of the vehicle, or is actually locked while the vehicle is still in motion, or is spinning while the vehicle is motionless. This displacement is used to control means for reducing the maximum brake pressure or the maximum power that may be applied to a maximum that the instant conditions of load, tire and road characteristics will permit without causing skidding or spinning of the particular wheel on which the accelerometers are mounted. Thus, by having the maximum pressure that may be applied to the brakes on each wheel, separately and automatically limited in this manner to get the maximum braking without skidding, a safe stop can be made even under the most hazardous conditions, in the shortest distance possible. Likewise, by having the maximum power applied, automatically limited in the same manner to get maximum acceleration, a fast spurt to the desired speed can be safely and most speedily accomplished, even under adverse road conditions.

3,608,981
RE-ADHESION APPARATUS FOR VEHICLES
Shigetomo Yui, Katsuta-shi; Tetsuji Hirotsu, Katsuta-shi, and Hisao Sonobe, Ibaragi-ken, all of Japan, assignors to Hitachi, Ltd., Tokyo-to, Japan
Filed Mar. 18, 1969, Ser. No. 808,093
Claims priority, application Japan, Mar. 22, 1968, Oct. 28, 1968, July 24, 1968, Nov. 29, 1968, 43/18211;43/77927;43/62834;43/103619
Int. Cl. B60t 8/08
U.S. Cl. 303—21 BE **25 Claims**



A re-adhesion apparatus for vehicles, including means adapted to detect together a change in the velocity of a nonadhesion axle with respect to the velocity of an adhesion axle and a differential of such change whereby nonadhesion phenomena in a vehicle can very early be detected in accordance with an output which is obtained when the detected values exceed preset levels.

3,608,982
METHOD AND APPARATUS FOR THE CONTROL OF ANTISKID BRAKE PRESSURE
Masami Inada; Tatsuo Hayashi, and Katuki Takayama, all of Kariya-shi, Aichi-ken, Japan, assignors to Aisin Seiki Company Limited, Asahi-machi, Kariya-shi, Aichi-ken, Japan
Filed June 12, 1969, Ser. No. 832,600
Claims priority, application Japan, June 22, 1968, 43/43534
Int. Cl. B60t 8/12, 13/60
U.S. Cl. 303—21 F **7 Claims**

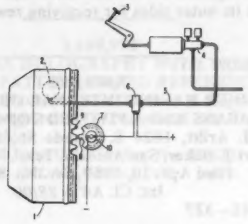


In a pneumatically servo-controlled hydraulic brake pressure control arrangement, comprising a pneumatic servo unit having two pneumatic piston chambers; a master cylinder unit operatively connected with said servo unit, on the one hand, and with hydraulic cylinder means for wheel or wheels of a powered vehicle, on the other; an air change off valve means adapted for receiving a wheel lock or lock-impending a signal from a wheel deceleration sensing means, the improvements comprise the provision of a check valve adapted for on-off controlling pneumatic flow from one of said servo piston chambers through said change off valve means, and a flow control valve adapted for throttling said flow, said check valve and said flow control valve being arranged in parallel to each other for suppressing otherwise possible excess repetition of hydraulic brake pressure increase and release in case of an abrupt and considerable application of the hydraulic braking effort.

3,608,983
INSTALLATION FOR PREVENTING THE LOCKING OF ONE OR SEVERAL WHEELS OF A VEHICLE DURING THE BRAKING
Adolf Steiner, Gerlingen-Waldstadt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed June 23, 1969, Ser. No. 835,653
Claims priority, application Germany, June 22, 1968, P 17 55 791.4
Int. Cl. B60t 8/16
U.S. Cl. 303—21 CG **3 Claims**

An installation for preventing locking of one or several wheels of a motor vehicle during braking in which the locking of a wheel is sensed magnetically producing a signal which is used as an input to a control unit controlling the reduction of the pressure medium in the brake line leading to the wheel starting to lock. U-shaped magnets are arranged in a magnetic wheel in such a manner that the alternating succeeding poles correspond to the tooth pitch of the

brakedrum. A rotary mass is coupled with the magnetic wheel such that it leads the magnetic wheel during locking of



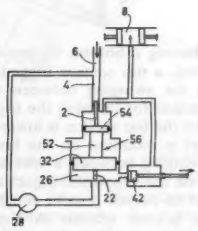
the wheel and thereby actuates a switch provided in the switching installation and connected with a valve.

3,608,984

RESTRICTION DEVICE FOR AN ANTILOCK BRAKE SYSTEM

Derek Robert Skoyles, East Grinstead, England, assignor to U.S. Philips Corporation

Filed July 24, 1969, Ser. No. 844,446
Claims priority, application Great Britain, Aug. 1, 1968, 36,746/68
Int. Cl. B60t *8/02*
U.S. Cl. 303—21 F **5 Claims**



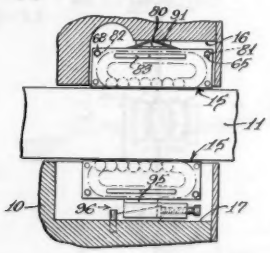
A restriction device for use within an antilock brake system to control pressurized fluid flow to the wheel brake. A restrictor element is slidably inserted within a section of the pressure line restricting flow therethrough; variations in the extent of penetration of the slide member will determine the degree of restriction.

3,608,985

BEARING PACK AND MOUNTING THEREFOR

Walter S. Swanson, Rockford, Ill., assignor to Sundstrand Corporation

Filed Apr. 2, 1970, Ser. No. 25,093
Int. Cl. F16c *29/06*
U.S. Cl. 308—6 C **16 Claims**



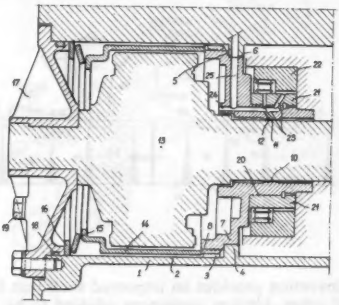
A bearing pack and mounting therefor which minimizes side forces, with the pack having a body member of a cross shape with a central section defining upper and lower lateral guide surfaces for at least two laterally spaced circuits of rolling bearings and with a lateral section extending beyond both sides of the central section intermediate the height thereof to have the lower surfaces define load bearing surfaces, additional members are associated with the body member for retaining the rolling bearings in their travelling circuits and the mounting includes a frame element with a recess for receiving the pack with a backup member aligned with said central section to permit movement of the pack relative to said backup member about plural axes to assist in obtaining uniform loading of the rolling bearings.

3,608,986

BEARING ASSEMBLIES

Jean Piret, Billancourt, France, assignor to Regie Nationale des Usines Renault, Billancourt (Hauts de Seine), France and Automobiles Peugot, Paris, France

Filed Dec. 22, 1969, Ser. No. 886,996
Claims priority, application France, Dec. 31, 1968, 183 138
Int. Cl. F16c *31/00*
U.S. Cl. 308—15 **1 Claim**



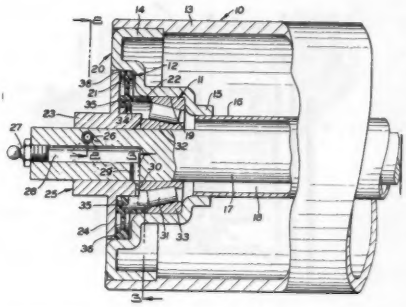
Bearing assembly for change speed mechanism which comprises a male peripheral surface adapted to engage a female surface of the casing enclosing said mechanism, a longitudinal bearing face and splines adapted to engage corresponding splines of said casing, this bearing assembly being characterized in that a member opposite to the casing-engaging bearing face coacts in transverse planes on the one side with said bearing and on the other side with a resilient member held by an abutment member against axial movement in relation to the casing.

3,608,987

SEAL FOR CONVEYER ROLLER BEARING

Kenneth K. Jordan, Bradley, W. Va., assignor to Electric & Machine Company, Huntington, W. Va.

Filed Oct. 9, 1969, Ser. No. 865,137
Int. Cl. F16c *13/00, 33/78*
U.S. Cl. 308—187 **4 Claims**



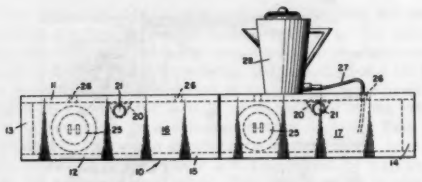
A seal incorporated in an antifriction-bearing unit of the type used in mounting conveyor belt supporting or similar

rollers. It comprises a one-piece seal in the form of an annular collar, preferably of nylon, which rotates with the roller and relative to the roller axle hub or bearing retainer. The seal collar is of such a cross section that it provides three relatively spaced annular sealing and bearing surfaces which effectively contact with adjacent fixed surfaces to seal lubricant in the bearing unit and to prevent the entry of dust into the bearing unit.

3,608,988
CULINARY APPLIANCE SHELF UNIT

Theodor K. L. Amberg, Wasserloserstrasse 15, 8755 Alzenau, Germany

Filed July 2, 1969, Ser. No. 838,503
Claims priority, application Germany, July 5, 1968, P 17 79 092.0
Int. Cl. A47b 77/08
U.S. Cl. 312—223 4 Claims

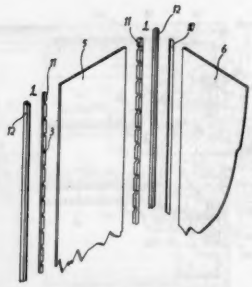


The invention provides an improved shelf unit for electrical, and other, kitchen appliances adapted to be supported on the wall or to rest on the work surface of a counter or of a floor cabinet. The shelf is hollow, and its interior space is adapted to house electrical outlets and cables as well as tools accessory to appliances normally stored on the shelf of the unit.

3,608,989
CABINET OR CABINET PANEL, FROM PREFABRICATED PARTS

Eberhard Wurster, and Thomas Peter Teschemacher, both of Reutlingen, Germany, assignors to Wilhelm Weller, Mobelfabrik, Nurtingen, Neckar, Germany

Filed Sept. 6, 1968, Ser. No. 757,969
Claims priority, application Germany, Oct. 23, 1967, W 45027
Int. Cl. A47b 43/00
U.S. Cl. 312—257 3 Claims

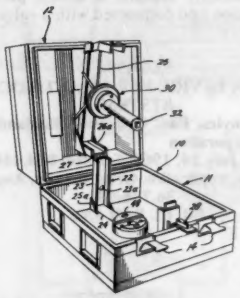


A prefabricated cabinet assembly having corner members comprising a pair of U-shaped rails, one nested inside the other. The inner rail has a plurality of notches in its sides for accommodating shelf support rails. Side panels are inserted into the inner rail. The rails are held together by mating grooves on their sides. The outer rail also has dovetail grooves in its outer sides for receiving rear panel connecting slats.

3,608,990
CONTAINER HAVING INTERNAL OBJECT SUPPORT MEANS AND A PIVOTED TOP SECTION

William H. Arlitt, 1024 S. Laredo St., Antonio, Tex., and Ethelbert J. Baker, San Antonio, Tex.

Filed Apr. 10, 1969, Ser. No. 815,156
Int. Cl. A47b 88/00
U.S. Cl. 312—327 22 Claims

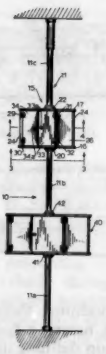


A container having a bottom section on which an object may be supported, a top section hingedly connected to the bottom section for swinging between raised and lowered positions, and means for latching the top section to the bottom section when the top section is lowered. An arm carrying a holddown part is mounted on the bottom section of the container for swinging between a lowered position in which such part bears on the supported object and a raised position above the object to permit it to be removed from supported position on the bottom section. A means is provided for releasably holding the arm in its lowered position to maintain the holddown part in engagement with the object. The holddown part is connected to the arm for movement toward and away from the supported object while the arm is held in lowered position.

3,608,991
COLLAPSIBLE SPRING-LOADED POLE-SUPPORTED CABINET

Ammon L. Wade, 801 Kenly Road, Goldsboro, N.C.

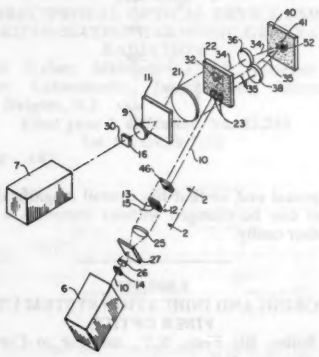
Filed Mar. 3, 1969, Ser. No. 803,689
Int. Cl. A47b 88/00
U.S. Cl. 312—345 2 Claims



A home storage cabinet suitable for use as a "bar" employs a set of collapsible wall and door members which can

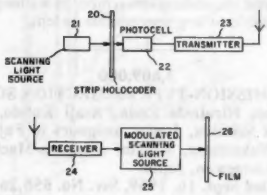
be broken down for storage and moving and can be assembled to provide storage space and held clamped in the assembled position between spring-loaded pole sections making up an extensible pole that extends between ceiling and floor.

3,608,992
MULTIPLEX HOLOGRAPHY WITH TRESNEL DIFFRACTION PATTERN CODED REFERENCE BEANS
Robert A. Phelps, Kettering, and Thomas J. Negrelli, Dayton, both of Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed June 18, 1970, Ser. No. 47,372
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **8 Claims**



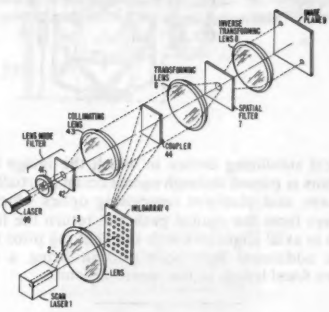
The present invention relates to a method of forming and utilizing a hologram by placing a Fresnel diffraction pattern and a Fourier transform lens in the reference beam during the formation of the hologram. An object pattern is placed in the object beam. A hologram of the near field or the far field of the object beam is formed by interfering the object beam and the reference beam at a recording medium in the focal plane of the Fourier transform lens. A reconstruction of the object pattern is produced from the hologram by passing the reference beam through the Fresnel diffraction pattern, the Fourier transform lens, the hologram, and a reconstruction lens.

3,608,993
METHOD AND APPARATUS FOR THREE-DIMENSIONAL IMAGING
Dominick John De Bitetto, Briarcliff Manor, N.Y., assignor to U.S. Philips Corporation, New York, N.Y.
Filed June 10, 1968, Ser. No. 735,710
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **15 Claims**



A three-dimensional imaging system and method in which original image information is obtained in the form of a series of full-field two-dimensional image recordings from different directions in a common plane. The three-dimensional image can be reconstructed by conversion of the recordings to a strip hologram employing coherent light, by viewing the recordings with incoherent light by means of an optical system having a moving lens or mirror, or by means of an optical system including an autocollimating screen.

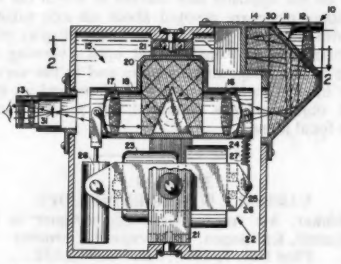
3,608,994
HOLOGRAPHIC INFORMATION STORAGE-AND-RETRIEVAL SYSTEM
James A. McDonnell, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 28, 1969, Ser. No. 819,679
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **3 Claims**



The invention concerns an information retrieval system in which a hologram is utilized as a mass-storage media that is scanned by means of a laser beam. The information which is retrieved is read out onto a photodiode array. Interposed between the hologram and the photodiode array is a key in the form of a spatial filter. When correlation is secured between the key and the information scanned in the hologram, an output beam is directed through the filter and onto the photodiode array.

A second hologram is further interposed between the filter and the first hologram to provide for conversion to a single font when different fonts are employed in the first hologram.

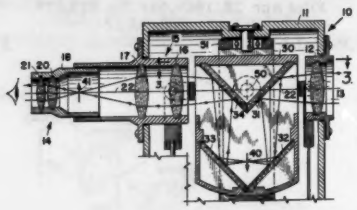
3,608,995
INTERMEDIATE OPTICAL PROCESSING STABILIZER
William E. Humphrey, Oakland, Calif., assignor to Optical Research and Development Corporation, Oakland, Calif.
Filed Sept. 4, 1968, Ser. No. 757,287
Int. Cl. G02b *23/02*
U.S. Cl. 350—16 **6 Claims**



An optical stabilizing device incorporating a relay optical system of substantially unit magnification which is inertially stabilized and adapted to relay an image from the objective lens focal surface a distance of one focal length of the objec-

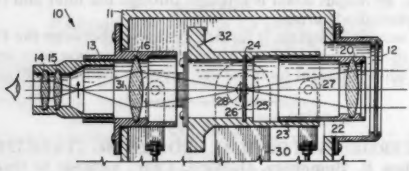
tive lens which is insensitive to pivot-point mounting, and other than unity magnification which is stabilized by selected pivot-point mountings.

3,608,996
OPTICAL PATH DETOUR STABILIZATION SYSTEM
William E. Humphrey, Oakland, Calif., assignor to Optical Research and Development Corporation, Oakland, Calif.
Filed Sept. 4, 1968, Ser. No. 757,288
Int. Cl. G02b *23/02*
U.S. Cl. 350—16 **2 Claims**



An optical stabilizing device in which the image from an objective lens is passed through optics on an inertially stabilized platform, said platform comprising optics which divert the light rays from the optical path and return the light rays to the path in axial alignment with the light ray prior to divergence, the additional light path portion being a distance equal to one focal length of the objective lens.

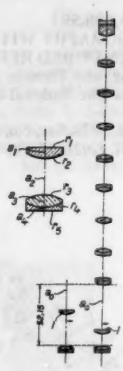
3,608,997
FOCAL PLANE STABILIZATION SYSTEM
William E. Humphrey, Oakland, Calif., assignor to Optical Research and Development Corporation, Oakland, Calif.
Filed Sept. 4, 1968, Ser. No. 757,289
Int. Cl. G02b *23/00*
U.S. Cl. 350—16 **11 Claims**



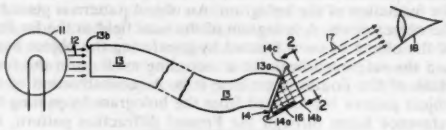
An image-stabilizing device incorporating in one embodiment an objective lens rigidly mounted to a transmissive image display plate in which the image from the objective lens is focused on the image display plate on one side and displayed on the opposite side thereof in which the lens and image display plate are pivoted about an axis substantially aligned with the focal plane of the image display plate and further incorporating nonstabilized optics viewing the obverse side of the image display plate and in the second embodiment having an image-receiving plane and an inertially stabilized objective lens mounted for pivotal movement about the focal plane.

3,608,998
VARIABLE POWER ENDOSCOPE
Walter Rinker, Am Anger, Germany, assignor to Richard Wolf GmbH, Knittingen, Wurttenberg, Germany
Filed Nov. 1, 1968, Ser. No. 772,522
Claims priority, application Germany, Nov. 25, 1967, P 15 66 112.8
Int. Cl. G02b *7/04, 7/10*
U.S. Cl. 350—42 **3 Claims**

An instrument for examining a relatively large area of the interior of a tube or other cavity in the human body in order to locate a lesion therein, and for then examining said lesion in greater detail without removing said instrument from said tube or other cavity. A variable magnification optical system is incorporated in said instrument sufficiently near its outward or proxal end so that the overall magnification of the instrument can be changed without removing it from said tube or other cavity.



3,608,999
MONITORING AND INDICATION SYSTEM UTILIZING FIBER OPTICS
Alan C. Bailey, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Dec. 31, 1969, Ser. No. 889,459
Int. Cl. G02b *5/14, 5/16*
U.S. Cl. 350—96 B **5 Claims**

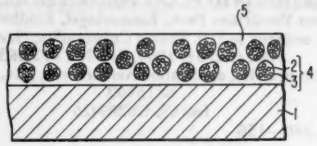


A system for monitoring and giving indications of the deenergized and energized conditions of a light source which, when energized, emits rays including actinic rays. One end of a fiber optic bundle is disposed adjacent a reflective surface of a normally transparent device of a phototropic material or having phototropic properties and the other end of the bundle is disposed adjacent said light source. An indication symbol is disposed so as to be reflected by the reflective surface of the transparent device when no light is transmitted by the fiber optic bundle from the light source to the reflective surface. When light is so transmitted, the phototropic properties of the normally transparent device cause the device to be darkened so that the indication symbol is no longer visible or is no longer visible to any appreciable extent.

3,609,000
TRANSMISSION-TYPE PROJECTION SCREEN
Shizuo Miyano; Hirotoshi Endo; Asaji Kondo, and Shingo Ooue, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Nakanuma, Minami Ashigara-Machi, Ashigara-Kamigun, Kanagawa, Japan
Filed Sept. 16, 1969, Ser. No. 858,261
Claims priority, application Japan, Sept. 16, 1968, Sept. 17, 1968, 43/66819;43/67133
Int. Cl. G03b *21/60*
U.S. Cl. 350—126 **13 Claims**

A transmission-type projection screen comprising a support having thereon a layer of a binder having microcapsules dispersed therein, said microcapsules containing particles of

a material having a refractive index different from that of said binder.

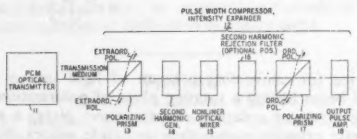


The transmission-type projection screen is one wherein the refractive index of said material differs from the refractive index of said binder by a factor of at least 0.02.

3,609,001
NONRECIPROCAL OPTICAL DEVICE USING POLARIZED SECOND HARMONIC GENERATED RADIATION

Heinz Paul Weber, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 1, 1970, Ser. No. 42,243
Int. Cl. G02b *5/30*
U.S. Cl. 350—147 **5 Claims**

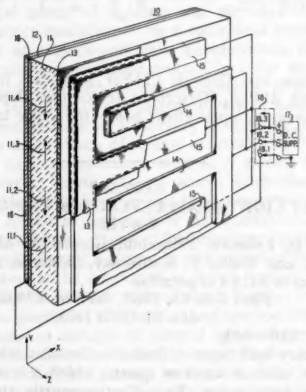


There is disclosed a nonreciprocal optical device in which optical wave energy is admitted through a polarizer, generates a second harmonic or orthogonal polarization, and mixes with the second harmonic to generate phase-matched fundamental wave energy of the orthogonal polarization, which is extracted through a crossed polarizer. Nonreciprocity results from the lack of phase-matching in the backward direction.

3,609,002
MULTIPLE ELEMENT OPTICAL MEMORY STRUCTURES USING FINE GRAIN FERROELECTRIC CERAMICS

David B. Fraser, Berkeley Heights; Juan R. Maldonado, North Plainfield, and Allen H. Meitzler, Morristown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 30, 1969, Ser. No. 889,087
Int. Cl. G02f *3/00*
U.S. Cl. 350—150 **11 Claims**

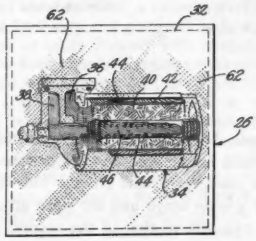


An optical image storage and display device is obtained by using the electrical polarization property of a plate of fine grain polycrystalline electrooptic ferroelectric, such as lead zirconate-lead titanate. Under the influence of an applied electric field, the polarization of a selected portion of the plate of ferroelectric locally is switched through a predetermined angle of less than or equal to 90°, if and when a scanning light beam or an electron beam is incident upon a photoconductive film deposited on the plate. Readout of the resulting permanent polarization is accomplished by means of another scanning light beam traversing the ferroelectric plate, the plate being located between a polarizer and an analyzer. Thereafter, the polarization of the plate can be switched back through an appropriate angle to its initial state ("erased", by means of another applied electric field.

3,609,003
ANIMATED DISPLAY DEVICE

Anthony Siksai, 2705 Lahser Road, Bloomfield Hills, Mich.

Continuation-in-part of application Ser. No. 197,128, May 23, 1962, now abandoned. This application Feb. 28, 1968, Ser. No. 709,138
Int. Cl. G02b *1/24*
U.S. Cl. 350—157 **10 Claims**

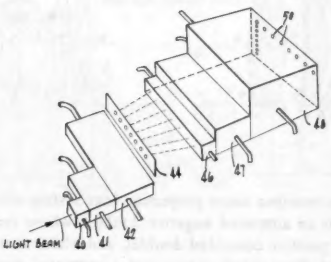


A device for animating a picture painted on a transparency. A light-intercepting sheet having a pattern of embossed motion lines overlies portions of the picture to be animated an the two are sandwiched between rotary and stationary polarized sheets. The picture becomes animated when the rotary polarizer is rotated and light is transmitted through the sheets in a manner to illuminate the picture.

3,609,004
LIGHT DEFLECTION SYSTEM

George William Taylor, Princeton, N.J., assignor to RCA Corporation

Filed May 14, 1968, Ser. No. 729,067
Int. Cl. G02f *3/00*
U.S. Cl. 350—160 **5 Claims**



Apparatus for selectively deflecting a light beam into one of a plurality of beam paths by selectively changing the effective optical path of the beam through a refractive transparent

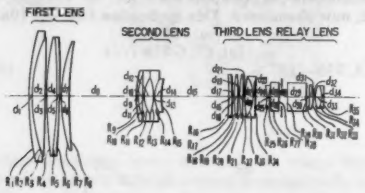
fluid. A first embodiment selectively varies the quantity of fluid traversed by the light beam. Other embodiments use the combined refractive effect of transparent fluids in adjacent transparent fluid chambers to position a light beam.

3,609,005

VARIFOCAL OPTICAL SYSTEM FOR ZOOM LENS HAVING ULTRA-HIGH ZOOM RATIO

Souichi Nakamura, Kamakura-shi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 1, 1969, Ser. No. 870,481
Claims priority, application Japan, Oct. 8, 1968, 43/72886
Int. Cl. G02b *15/14*
U.S. Cl. 350—184 3 Claims



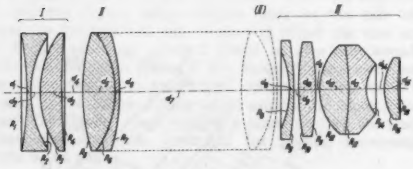
Varifocal optical system for zoom lens of this invention attains a zoom ratio larger than 20 and consists of convergent, divergent and convergent lens groups. The second group is movable over a wide range and the third group is moved in the direction opposite to that of the second group so as to constitute the zoom operation maintaining the position of image surface constant.

3,609,006

ZOOM PROJECTION LENS SYSTEM HAVING A MOVEABLE POSITIVE COMPONENT

Ladislav Pospisil, Veselicko, Czechoslovakia, assignor to Meopta narodni podnik, Prerov, Czechoslovakia

Filed July 8, 1969, Ser. No. 839,990
Claims priority, application Czechoslovakia, July 12, 1968, 5120-68
Int. Cl. G02b *15/14*
U.S. Cl. 350—184 4 Claims



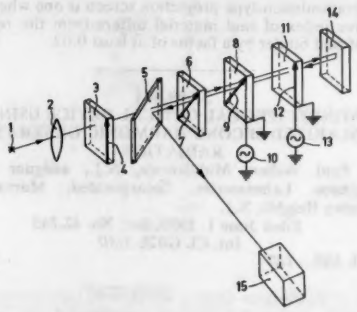
A three-member zoom projection lens system whose front member is an airspaced negative doublet, whose central element is a positive cemented doublet, and whose rear member consists of three simple lenses and a cemented doublet, the central member being axially movable between the fixed front and rear members. A lens combining an *f*-number of 1.2 with a ratio of maximum and minimum focal lengths of 2.4 in a projector for Super-8 motion picture film can be obtained by maintaining certain parameters in the lens design.

3,609,007

DEVICE FOR CONVERTING CIRCULARLY POLARIZED RADIATION INTO PLANE-POLARIZED RADIATION

Theodorus Hendrikus Peek, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1969, Ser. No. 872,863
Claims priority, application Netherlands, Nov. 8, 1968, 6815909
Int. Cl. G02f *1/26*
U.S. Cl. 350—150 3 Claims



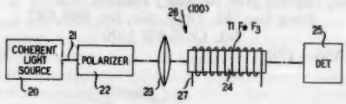
A device for converting a beam of light into a plane-polarized beam having a rotating plane of polarization using a serially arranged polarizer, quarter-wave plate, a pair of electrooptic crystals having their principle planes mutually offset by 45° and modulated by voltage sources in phase quadrature, and a retroreflective element for redirecting the polarization through the electrooptic crystals and the quarter-wave plate.

3,609,008

THALLIUM IRON FLUORIDE AND DEVICES UTILIZING SAME

Joseph F. Dillon, Jr., Morris Township, Morris County, and Howard J. Guggenheim, Somerville, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 29, 1968, Ser. No. 771,544
Int. Cl. G02f *1/22*
U.S. Cl. 350—151 8 Claims



Thallium iron fluoride ($TlFeF_3$) appears to be isostructural with $RbFeF_3$. Described device uses depend primarily on the magneto-optic effect below the Curie temperature of about 77° K.

3,609,009

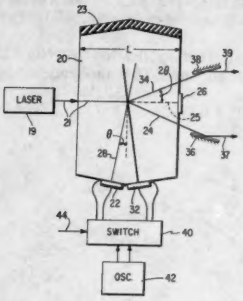
BINARY LIGHT BEAM DEFLECTOR USING ACOUSTIC WAVES

Robert D. Lohman, Princeton; Gerard A. Alphonse, Princeton, and Walter F. Kosonocky, Skillman, all of N.J., assignors to RCA Corporation

Filed Feb. 13, 1969, Ser. No. 799,020
Int. Cl. G02f *1/28*
U.S. Cl. 350—161 2 Claims

A binary light beam deflector is disclosed which includes a medium, such as water or quartz, which is transparent to an incident light beam. Two electroacoustic transducers are positioned to propagate acoustic waves of the same frequency through the medium so that each acoustic wave intercepts the incident beam at an angle equal to the Bragg angle. A

radiofrequency oscillator is connected to one or the other of the transducers to cause deflection of the light beam in one



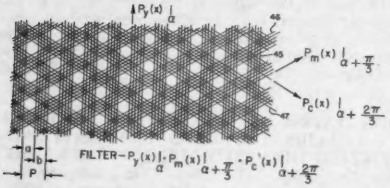
or the other of two output directions. A plurality of the described deflectors may be arranged in cascade to provide any desired amount of deflection in binary steps.

3,609,010

SPECTRAL ZONAL FILTER

Peter F. Mueller, Concord, Mass., assignor to Technical Operations, Incorporated, Burlington, Mass.

Division of Ser. No. 564,340, July 11, 1966, abandoned.
Filed Jan. 30, 1969, Ser. No. 810,897
Int. Cl. G02b *27/38*
U.S. Cl. 350—162 SF **5 Claims**



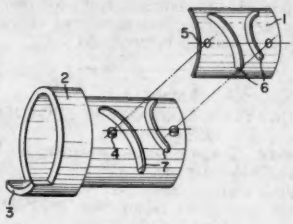
This invention relates to spectral zonal photography in which spectral zones of a scene are stored with unique respective carrier modulations on a colorblind photostorage medium such as a black-and-white panchromatic film from which the scene can be reconstructed in color by Fourier transform techniques with spatial and spectral filtering, and in particular to methods and means to effect such storage without the intervention of a plurality of separate individual images of the scene. Each of several spectral zones is modulated with a periodic function, such as a grating having a unique orientation relative to the scene. Embodiments are disclosed in which these zones and their respective modulations can be stored in sequence or simultaneously. Unique spectral zonal filters are disclosed for simultaneous storage of several spectral zones of a scene. In one aspect of the invention such filters can be employed in direct contact with the storage medium. In another embodiment. Fourier transform techniques are employed with spatial and spectral filtering to effect simultaneous storage of several spectral zones of a scene. In all embodiments the final storage of color-coded information in a colorblind storage medium is useful to reconstruct the original scene in the original colors or in any desired portion or portions of the visible spectrum by means of Fourier transform and filtering techniques. The reconstructed scene can be viewed in full color or recorded on a color-sensitive medium.

3,609,011

ZOOM RING FOR ZOOM LENS

Keiichi Sakaguchi, Yokohama-shi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 14, 1969, Ser. No. 850,131
Claims priority, application Japan, Aug. 20, 1968, 43/71,669
Int. Cl. G02b *7/10*
U.S. Cl. 350—187 **2 Claims**



A zoom ring is provided for a zoom lens, the ring being made of at least two members; a cylindrical member including a rotational limit stop and provided with cam slots, and a curved member or plate formed with matching cam slots. The cam slots in both members register with each other when the curved plate is positioned on the cylindrical member by means of pin connections, the cam slots in the cylindrical member being relieved while the plate cam slots are accurately machined.

In zoom lens systems, the zoom lens or lenses are shifted longitudinally with respect to the optical axis of the objective by means of a cam ring having formed therein, cam grooves which may be either curved or straight grooves.

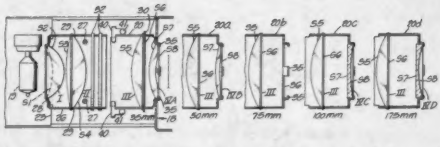
The cam grooves are machined individually to close tolerances to provide accurate focusing, particularly when two lens elements of the objective are separately movable. The zooming cam ring is further provided with a stop member, either in the form of a pin or projection and which may be integrally formed with the ring, to prevent rotation of the ring beyond a predetermined angle and to provide a positive limit for the focusing plane of the objective. Such rings in the past have been manufactured on an individual basis due to the close tolerances required in forming the cam grooves and in setting the stop member. In addition, the wearing down or breaking of the cutting tools led to further complications in providing an accurately machined cam ring suitable for optical work.

3,609,012

OPTICAL CONDENSING SYSTEM WITH VARIABLE EFFECTIVE FOCAL LENGTH

Chan Street, El Segundo, Calif., assignor to Spindler & Sauppe, Inc., Glendale, Calif.

Filed Oct. 6, 1969, Ser. No. 864,117
Int. Cl. G02b *3/04*
U.S. Cl. 350—189 **12 Claims**



A versatile optical condensing system readily convertible for use with projection lenses covering a wide range of focal lengths, as 35 to 250 mm. using a common group of lenses by themselves or in combination with a selected one in a second group of lenses. This system is characterized by its simplicity, compactness, highly uniform light intensity, minimal chromatic abberation and ability to hold the image size of the

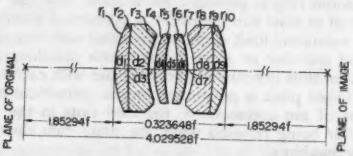
light source to a minimum at the entrance pupil of the projection lens to avoid the need for costly high-speed projection lenses. The basic lens system utilizes three lens the second and third of which each have one aspheric surface designed with controlled spherical abberation and so that the light rays passing between these two aspheric surfaces are substantially parallel to the optical axis. This feature makes it feasible to vary the axial spacing of these two lenses as necessary to accommodate the basic lens system for optimal use wit a selected supplemental condensing lens and one of several projection lenses of differing focal lengths. The invention makes it possible to manufacture of wide range of condensing system sizes at very substantial cost savings using a minimum number of variable components.

3,609,013

SYMMETRICAL FOUR-COMPONENT PHOTOCOPYING LENS SYSTEM

Motoaki Kawazu, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Mar. 26, 1970, Ser. No. 22,798
Claims priority, application Japan, Mar. 29, 1969, 44/24,126
Int. Cl. G02b 9/58
U.S. Cl. 350—220 **1 Claim**



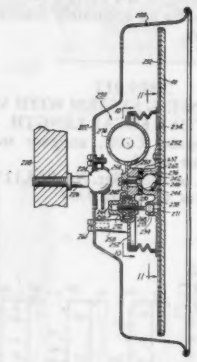
A holosymmetrical photocopying lens system with a field angle of 53° and an aperture ratio of 1 : 4.5 is provided. Within the range from *c*-line (565.3 mμ) to *g*-line (435.8 mμ), both of the spherical aberration and astigmatism are well corrected with a resolution of 20 lines/mm.

3,609,014

ELECTRIC REMOTE CONTROL REAR VIEW MIRROR

Arthur W. Kurz, Jr., P.O. Box 454, Birmingham, Mich.

Continuation-in-part of application Ser. No. 467,064, June 25, 1965, now abandoned. This application June 10, 1970, Ser. No. 45,141
Int. Cl. G02b 5/08; B60n 1/06
U.S. Cl. 350—289 **5 Claims**



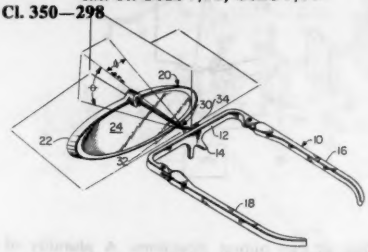
An electric remote power-controlled rearview mirror for a vehicle, which is adapted to be mounted externally of the vehicle adjacent the windshield and at the left or right side of the vehicle for convenient viewing by the operator of the vehicle. The mirror is pivotally supported by a three-point pivot connection of which the center pivot connection is stationary to permit angular movement of the mirror therearound. The remaining two pivot connections are spaced an equal distance radially outwardly from the center pivot and arc connected to pins or rods which are individually actuatable for longitudinal movement by power means including at least one reversible motor to thereby positively angularly adjust the mirror around the center pivot.

3,609,015

HAIRSTYLING AND MAKEUP MIRROR DEVICE

Jules Messinger, Weinbergstrasse 74, 8006 Zurich, Switzerland

Continuation-in-part of application Ser. No. 833,900, June 13, 1969, now abandoned. This application Aug. 15, 1969, Ser. No. 850,367
Int. Cl. G02b 7/18; G02C 7/14
U.S. Cl. 350—298 **4 Claims**



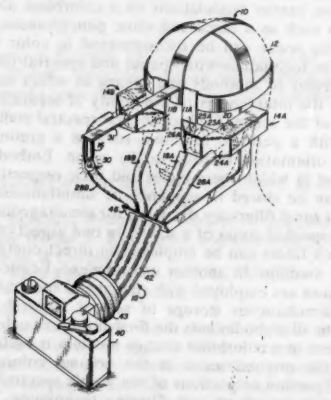
A novel hairstyling and makeup mirror device is disclosed, the device including a frame adapted to be worn about the the eyes of the user, similar to an eyeglass frame. A normal or flat or, if desired, even a magnifying mirror is attached to the front or forehead bar portion of the frame by means of an elongated rod which may be telescopically constructed. One end of the rod is preferably pivotally attached to the mirror while the other end of the rod is pivotally attached to the frame, the pivotal connection at the frame in the preferred embodiment comprising a magnetically operable ball and socket joint. With the novel device, the mirror is displaceable to virtually any position relative to theeyes of the user such that when the user stands with his back toward a fixed mirror, the back of the head can be viewed so as to facilitate hairstyling. Alternatively, the mirror can be displaced into a position so as to provide a reflection of the viewer's eyes to facilitate the application of eye makeup or other cosmetic operations.

3,609,016

VISION-TESTING DEVICE FOR VISUALLY DISPLAYING A CALIBRATED SIGNAL TO THE EYE AND RECORDING THE RESPONSIVE MOVEMENT THERETO

Arthur Jampolsky, Mill Valley, Calif., assignor to Optical Sciences Group Incorporated, San Francisco, Calif.

Continuation of application Ser. No. 699,896, Jan. 23, 1968. This application Dec. 30, 1969, Ser. No. 888,123
Int. Cl. A61b 3/14; G02b 27/02
U.S. Cl. 351—7 **6 Claims**



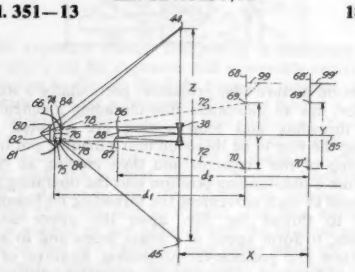
A vision-testing device in the form of a frame which is placed in contact with and supported by the head of the sub-

ject to allow the subject freedom of head movement during examination. The frame carries a pair of signal display elements plus optical path modifiers, one for each eye, for forming, displaying and directing a separate display stimulus toward each eye without interfering with the normal vision. The frame further carries a set of flexible light pipes whose objectives are positioned to image the eyes upon a photographic recording means without interfering with the normal vision of the subject along with a record of the stimulus which is being directed to the eyes. Finally, the frame carries a point source of light which is positioned forward of and in a plane bisecting the eyes to provide corneal reflections from both eyes.

3,609,017
MEANS FOR EXTENDING THE RANGE OF KERATOMETERS

Benjamin Nuchman, 820 Birchwood Drive, Westbury, N.Y., and Sang Y. Whang, 8445 S. W. 148th Drive, Miami, Fla.

Continuation-in-part of application Ser. No. 814,895, Apr. 7, 1969, now abandoned. This application May 21, 1970, Ser. No. 39,346
Int. Cl. A61b *3/10*
U.S. Cl. 351—13 **18 Claims**

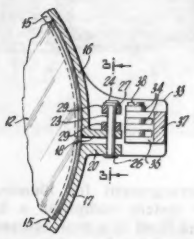


Means for extending the range of a keratometer to measure the curvature of a cornea in a region spaced a greater distance from the optical axis of said keratometer than the region normally measured. Said means includes a further set of illuminated mires adapted to produce a virtual image inside the cornea larger than the virtual image produced by the original mires, and diverging lens means for producing a secondary virtual image from the virtual image produced by said further set of mires which can be read directly by said keratometer while being representative of the radius of curvature in the new region.

3,609,018
SPECTACLES HAVING RESILIENTLY CLOSED LENS RIMS

Michael Marolla, Fort Lauderdale, Fla., assignor to Paramount Optical Mfg. Corp., Woodside, N.Y.

Filed Jan. 8, 1970, Ser. No. 1,401
Int. Cl. G02c *1/08*
U.S. Cl. 351—95 **3 Claims**

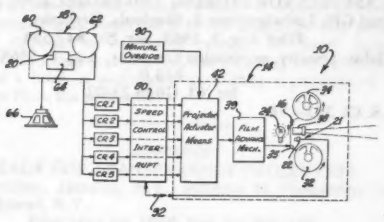


A replaceable lens spectacle structure comprises lens rims which are split at their outer sides to delineate opposite relatively movable frame portions terminating in outwardly directed apertured ears. A guide rod having enlarged end heads slidably engages the ears and a U-shaped spring has openings in its legs engaging the guide rod and is trapped between one of the ears and a guide rod end head resiliently to close the rim. Each closure assembly is masked by a laterally projecting masking plate mounted on a portion of the rim in front of the rim closure assembly and a temple piece is hinged to the plate.

3,609,019
FILM PRESENTATION SYSTEM

Richard J. Tuber, Encino, Calif., assignor to North American Philips Corporation, New York, N.Y.

Continuation of application Ser. No. 550,294, May 16, 1966. This application July 28, 1969, Ser. No. 847,813
Int. Cl. G03b *31/00*
U.S. Cl. 352—17 **8 Claims**

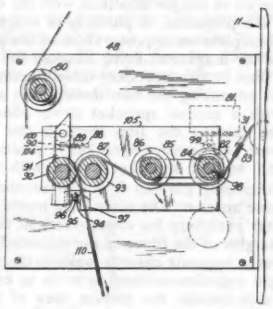


The invention is a system for making combined sound and visual presentations, the entire presentation being a composite of component parts combining sound and visual displays wherein the visual displays may be fixed pictorial presentations or animated pictorial presentations projected at different rates. The system has the purpose of greatly minimizing the amount of film required for the desired presentations. Preferably there is a separate sound tape which generates signals controlling a film projector to operate it at different rates which may include the normal rate for moving pictures; rates which are fractions of this rate for purposes of animation; and for completely stopping the projection at an individual frame for stills. Preferably the stopping of the projector at individual frames is achieved by way of a signal generated from the film strip itself and in the preferred form of the invention this is an optical signal controlling a photocell.

3,609,020
FILM PROJECTOR AND AUTOMATED THEATER PROJECTION SYSTEM

Joseph Kelly, Huntington, N.Y., assignor to Minitek, Inc., New Castle, Del.

Filed Mar. 24, 1969, Ser. No. 809,620
Int. Cl. G03b *21/50*
U.S. Cl. 352—40 **24 Claims**



A film projector is provided with a cue detector for generating a signal to start a theater-control procedure or

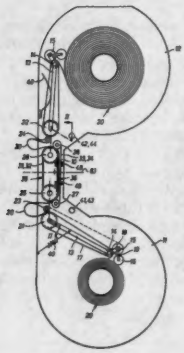
sequence when a transparent or translucent tape is detected on a film which is to be or has been projected. The projector also has a cleaning attachment through which the film passes prior to entering the interior of the projector. A programmer and associated circuitry are provided for automatically turning off pre- or inter-show music, dimming house lights, turning on the projector as well as picture sound mechanisms, and opening the curtain at the beginning of a show in the theater. The programmer is moreover adapted for closing the curtain, turning up the house lights, turning off the projector and sound mechanisms, turning on the aforesaid music, and turning off the projector at the end of a show. The programmer, in one form, includes a bank of cams relative to which special provision is made to avoid self-terminating characteristics.

3,609,021

CASETTES FOR STORING AND PROJECTING A FILM

Ernst Gill, Ludwigstrasse 8, Saarlouis, Germany

Filed Aug. 5, 1969, Ser. No. 847,554
Claims priority, application Germany, Aug. 8, 1968, P 17 97 048.8
Int. Cl. G03b *23/02*
U.S. Cl. 352—78 **10 Claims**



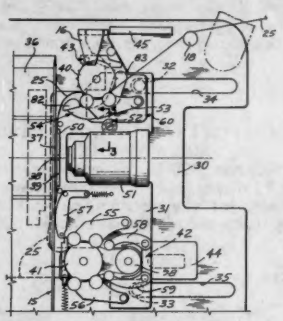
A cassette adapted for storing a perforated film having at least two mutually parallel series of images which can be reproduced in opposite directions of advance so that the film may be projected by a cinema projector. The cassette comprises a casing having a plurality of connected walls, one of the walls comprising a baseplate with bushings for aligning one of the series of images at a time with the optical projection axis of the projector. A plurality of magazines are carried by the baseplate on opposite sides of the projection axis with each of the magazines being adapted for receiving and storing the film. A first sprocket drive is connected to the baseplate for advancing the film through the area of projection axis with a second sprocket drive connected to the baseplate for feeding the film through the first sprocket drive. At least one transfer sprocket is positioned between the first and second sprocket drives with each transfer sprocket comprising parallel first and second discs spaced relative to one another. The discs have toothlike projections on their outer periphery for engagement in the perforations along the margins of the film and are mounted independently of each other in opposite cassette walls so that they are coaxially arranged and dimensioned as to lie to each side of the projection axis outside the picture area of the film in all operative positions of the cassette. The first disc has a shaft engaging it with the shaft extending through the baseplate and having a driving disc at its free end outside the baseplate cassette casing wall.

3,609,022

MOTION PICTURE FILM PROJECTOR

Morris Schwartz; Conkling Chedister, and Frank H. Beckman, all of Plainville, Conn., assignors to The Kalart Company Inc., Plainville, Conn.

Filed July 17, 1969, Ser. No. 842,618
Int. Cl. G03b *1/58*
U.S. Cl. 352—158 **17 Claims**



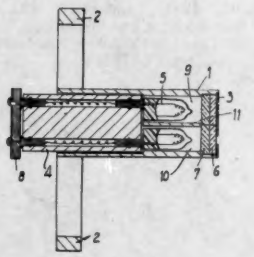
A motion picture film projector, particularly a sound film projector, has an automatic film-threading mechanism with which threading and loop setting are effected by first dropping the film to be threaded into a loading slot formed in the casing of the projector and then moving an operating lever from a film-loading position into the operating position. As a result of such movement the threading mechanism is activated to thread the film upon the upper and lower sprockets, to form upper and lower loops and to move the lens system into position for projection. Removal of the film is effected by simply returning the operating lever to its loading position thereby freeing the film from its engagement with the components of the threading mechanism so that the film can be lifted out of the slot.

3,609,023

HEADUP DISPLAY SYSTEMS FOR AIRCRAFT PILOTING

Jean Turboult, and Marcel Morion, both of Paris, France, assignors to CSF-Compagnie Generale de Telegraphie Sans Fil

Filed June 21, 1968, Ser. No. 738,850
Claims priority, application France, June 29, 1967, 112,498
Int. Cl. G03b *21/00*
U.S. Cl. 353—13 **7 Claims**



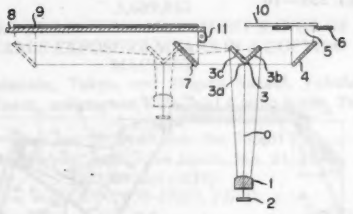
A lighting arrangement for illuminating reticles in a headup display system comprises a hollow shaft having opaque walls and fixed to a movable assembly controlled in position, the reticle being formed in an end wall of this shaft, and a lampholder slidably mounted in this shaft for carrying plugin bulbs inside this shaft. This arrangement also comprises a translucent body between the bulbs and the reticle and printed circuits plugged into the lampholder for supplying the bulbs. A colored filter may be positioned between the reticle and the bulbs or in front of the reticle.

3,609,024

SLIT EXPOSURE DEVICE

Shigeru Suzuki, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Mar. 13, 1969, Ser. No. 806,843
Claims priority, application Japan, Mar. 19, 1968, 43/18,142
Int. Cl. G03b 27/70
U.S. Cl. 355—51 3 Claims



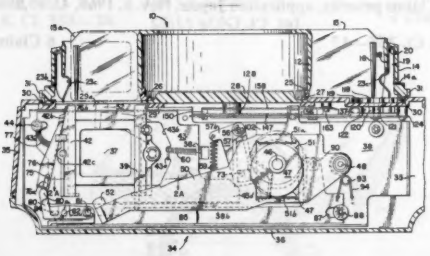
A slit exposure device comprising a stationary original holder and a slit for exposure and a movable optical system for directing to the slit the light from the original. This optical system includes a photocopying lens having a reflecting mirror integrally disposed at the rear surface of the lens, a V-shaped reflecting mirror having two reflecting surfaces and a movable reflecting mirror adapted to impinge upon the lens the light from the original, and the V-shaped reflecting mirror and a stationary reflecting mirror to impinge the light emanating from the lens to the slit. The lens moves in the direction normal to and parallel with the original at a speed one-half of that of a photocopying paper while the V-shaped and movable reflecting mirrors move in parallel with the original at speeds one-half and equal to that of the copying paper respectively.

3,609,025

SLIDE-CHANGING MECHANISM FOR A SLIDE PROJECTOR

Walter J. Hall, Chicago, Ill., assignor to General Aniline & Film Corporation, New York, N.Y.

Division of Ser. No. 684,202, Nov. 20, 1967, Patent No. 3,499,708, which is a continuation-in-part of Ser. No. 554,071, May 31, 1966, abandoned.
Filed July 30, 1969, Ser. No. 872,787
Int. Cl. G03b 02, 06, 04
U.S. Cl. 353—107 2 Claims



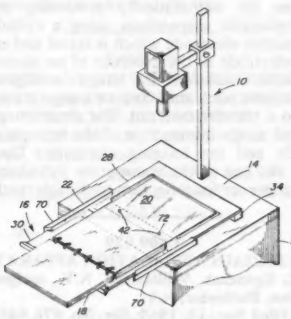
The projector includes a vertically disposed projection gate located adjacent one side of the projector housing. The housing has a top wall portion with a slot therein disposed over the gate for entry of a slide thereinto and for exit of a slide therefrom. The projection gate includes a pair of vertically extending slide guides. One of these guides is mounted for movement toward and away from the other guide for alternately releasing and gripping the slide at the side edges thereof. The movable guide contacts a slide-releasing arm which causes a release of a slide in the magazine thereby allowing such slide to drop into the gate. The rotary slide magazine has a plurality of slide-receiving spaces which are open at the tops and bottoms. A spring finger is mounted in each slide-receiving space for yieldable engagement with a side edge of a slide for releasably retaining the slide in its space in the magazine. When a slide is positioned over the housing slot which is in turn located over the projection gate, and when the spring finger biasing such slide is contacted by the aforementioned slide-releasing member, the slide is allowed to drop into the gate. The projector includes an indexing gear engaged with a series of teeth on the magazine for indexing the magazine in forward and reverse directions. The indexing gear is rotated in either direction by indexing means in the projector, such indexing means including a locking member which is yieldably urged into its locked position and positively withdrawn to an unlocked position. The projector includes a cam-operated lifting member to return the slide in the projection gate to its place in the magazine. The projector also includes an operating member or "load" button. When this member is depressed, the indexing means are disabled and a latch is withdrawn permitting separation of the magazine from the projector.

3,609,026

STAGE FOR TRANSPARENCY PROJECTION

Max Verebay, Jamaica, N.Y., assignor to Visionetics, Inc., Long Island, N.Y.

Filed May 19, 1969, Ser. No. 825,685
Int. Cl. G03b 27/00
U.S. Cl. 353—120 10 Claims



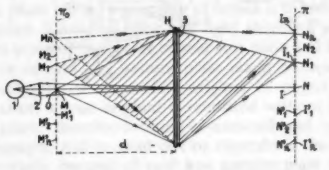
A stage assembly for the projection of transparencies comprising a main frame adapted to slidingly and opposingly house a viewing member and a supporting member so that the viewing and supporting members may be horizontally extended for use or horizontally retracted when not in use.

3,609,027

ARRANGEMENT FOR PRODUCING MULTIPLE IMAGES

Serge Lowenthal, Paris, France, assignor to Thompson CSF

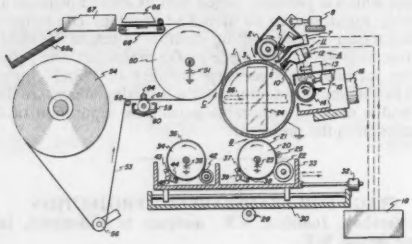
Filed Apr. 29, 1969, Ser. No. 820,058
Claims priority, application France, May 15, 1968, 151,801
Int. Cl. G03b 27/44
U.S. Cl. 355—2 8 Claims



An arrangement for projecting by means of a quasi-monochromatic incoherent source of radiant energy, multi-

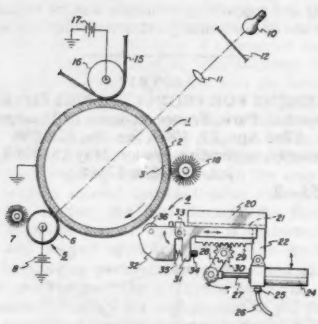
ple images of a transparency illuminated by the above-mentioned source. The multiple images are projected through the medium of a holographic lens.

3,609,028
IMAGING APPARATUS
Raymond K. Egnaczak, Williamson, and Gino F. Squassoni, Pittsford, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed Nov. 14, 1969, Ser. No. 876,640
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **15 Claims**



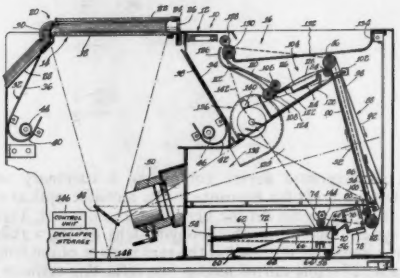
A machine for automatically producing images from photoelectrophoretic suspensions using a cylindrical transparent conductive electrode which is inked and contacted by an imaging electrode in the presence of an electric field and electromagnetic radiation in image configuration. The cylinder electrode is cleaned and an image transferred from its surface to a transfer material. The electromagnetic radiation is imaged at the intersection of the transparent cylindrical electrode and the imaging electrode. The projection passes from the end of the transparent cylindrical electrode to an internal mirror for reflection to the intersection.

3,609,029
MATERIALS APPLICATION APPARATUS
Raymond K. Egnaczak, Williamson, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Nov. 14, 1969, Ser. No. 876,646
Int. Cl. G03g *15/00*
U.S. Cl. 355—3 **7 Claims**



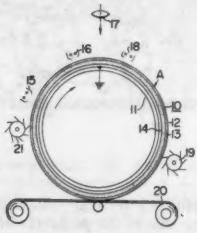
Apparatus for supplying a fluid coating to a surface. The apparatus has an extruder extending across the length of a movable surface with a manifold fluid supply system to force the fluid through the extruder. One embodiment includes a roller applicator as part of the extruder and a vacuum pickup to remove excess fluid from the surface.

3,609,030
ELECTROSTATIC BOOK COPIER
Meyer L. Sugarman, Northbrook, and William B. Jarzembski, Riverside, both of Ill., assignors to Opto/Graphics, Inc., Kenilworth, Ill.
Filed Apr. 2, 1968, Ser. No. 718,142
Int. Cl. G03g *13/10*
U.S. Cl. 355—10 **5 Claims**



A compact or tabletop electrostatic book copier having at the top thereof an exposure station on which a book is laid with a mirror and lens optical system for projecting an image of the book page to a more or less vertical exposing station. Paper is fed from a paper safe at the bottom of the machine through a charging unit substantially horizontally, and then substantially vertically up to the exposing station where the paper is exposed. From the top of the exposing station the paper is fed face down in a downwardly diagonal direction over a developing station, and along an inverting reentrant path to a delivery station immediately above the developing station where the copy is delivered face up.

3,609,031
METHOD OF FORMING ELECTROSTATIC LATENT IMAGES
Koichi Kinoshita, Narashino-shi, Japan, assignor to Katsuragawa Denki Kabushiki Kaisha, Tokoy-to, Japan
Filed June 5, 1969, Ser. No. 830,676
Claims priority, application Japan, Nov. 5, 1968, 43/80,880
Int. Cl. G03g *13/22*
U.S. Cl. 355—17 **6 Claims**



In a method of forming an electrostatic latent image by the steps of applying a first electric field across a photosensitive

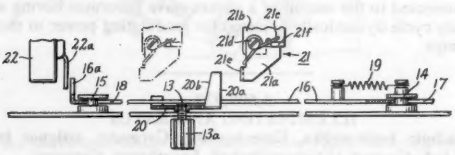
element including a photosensitive layer and a highly insulative layer so as to deposit a first uniform change of one polarity upon the surface of the highly insulative layer and to establish a uniform charge distribution in the photosensitive layer, applying a second electric field across the photosensitive element to deposit a second charge of the opposite polarity and projecting a light image upon the photosensitive element concurrently with the application of the second field, the second field is applied in two spaced-apart periods and the light image is projected between the periods.

3,609,032

DEVICE FOR LIMITING MOVEMENT RANGE OF A MOVABLE EXPOSURE MEANS IN A COPYING MACHINE

Toshio Watanabe, Tokyo, and Shigeru Suzuki, Yokohama, both of Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Jan. 30, 1969, Ser. No. 795,317
Claims priority, application Japan, Jan. 31, 1968, 43/6375;43/6376
Int. Cl. G03b *27/50, 27/70*
U.S. Cl. 355—25 **3 Claims**



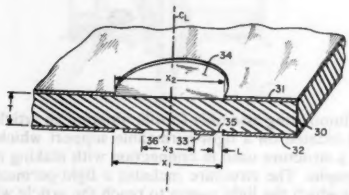
A device for limiting the movement of a reciprocable exposure unit in a copying machine including a manual setting for a positioning element corresponding to the size of the copy sheet. A collidable element on the exposure unit moves to contact the positioning element thereby actuating a microswitch to reverse the movement of the exposure unit. The collidable element includes a spring-biased pivotal portion that makes the movable contact and is rotatably movable from one side to the other side of the collidable element.

3,609,033

MASK FOR ETCHING ENLARGEMENT

John J. Frantzen, North Saint Paul, Minn., assignor to Buckbee-Mears Company, St. Paul, Minn.

Filed Aug. 15, 1969, Ser. No. 850,450
Int. Cl. G03b *27/32*
U.S. Cl. 355—26 **4 Claims**



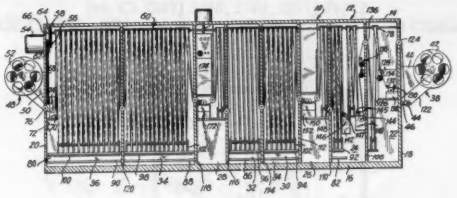
A mask has a metallic material, preferably cold-rolled steel, covered by an etchant-resist layer on both sides. On one side the layer has a circular area of diameter X_2 void of etchant resist, and on the second side the layer has a circular area of diameter X_3 and an annular area of outer diameter X_1 both void of etchant resist. The three areas are coaxially aligned.

3,609,034

METHOD AND APPARATUS FOR TREATING FILM

Yar W. Mociuk, 66 Hazelton Road, Yonkers, N.Y.

Filed May 5, 1969, Ser. No. 821,622
Int. Cl. G03b
U.S. Cl. 355—30 **16 Claims**



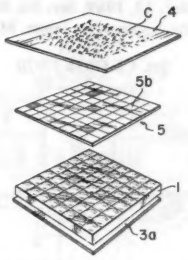
Method and apparatus for treating film, wherein the apparatus comprises a plurality of baths for treating the celluloid and emulsion sides of a film, and wherein each bath comprises an assembly of treating wheels constructed and arranged to present a meniscus of treating fluid to the surfaces of the film. The method comprises at least the steps of exposing the celluloid side of the film to a meniscus of fluid to remove scratches from that surface, exposing the emulsion side to a meniscus of fluid, and then drying the film to fill in any abrasions surface marks, and the like.

3,609,035

METHOD AND DEVICE FOR RECORDING CHARACTERS OR SYMBOLS IN A REPRODUCIBLY INDISCERNIBLE MANNER

Hisanori Ataka, Kawasaki-shi, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Dec. 17, 1969, Ser. No. 885,694
Claims priority, application Japan, Dec. 30, 1968, 43/96549
Int. Cl. G03b *27/52*
U.S. Cl. 355—40 **3 Claims**

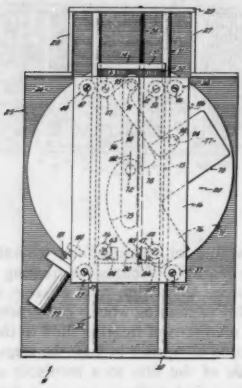


A method and device for recording characters or symbols in a reproducibly indiscernible manner, in which adjacent to a lens plate having a plurality of lenses is disposed a key pattern plate having at least one light shielding portion which covers some of the lenses of said lens plate and the remaining portion of said key pattern plate made transparent when a camouflaging or concealing original or object is recorded; thereafter, a true original is recorded without said key pattern plate, thereby forming a camouflaged or concealing photograph; and to read out or reproduce the camouflaged photograph, instead of said key pattern plate is disposed a decoding plate having the light shielding and transparent portions complementary to those of said key pattern plate when said camouflaged photograph is projected.

3,609,036
GEARLESS CAMERA-FOCUSING APPARATUS

Warren D. Novak, Chappaqua, N.Y., assignor to The Mosler Safe Company, Hamilton, Ohio

Filed June 2, 1969, Ser. No. 829,231
Int. Cl. G03b 27/36
U.S. Cl. 355—58 25 Claims

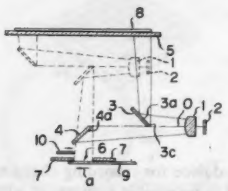


A variable-magnification closed-circuit television system. The system comprises an adjustment mechanism for synchronously positioning a lens and a camera relative to an objective so as to enable the lens to both magnify and reduce the image while always maintaining the image accurately in focus. The adjustment mechanism comprises a plate cam for positioning the lens and a crank driven from the plate cam for positioning the camera.

3,609,037
SLIT EXPOSURE OPTICAL SYSTEM

Shigeru Suzuki, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed Mar. 13, 1969, Ser. No. 806,825
Claims priority, application Japan, Mar. 19, 1968, 43/18141
Int. Cl. G03b 27/70
U.S. Cl. 355—66 3 Claims

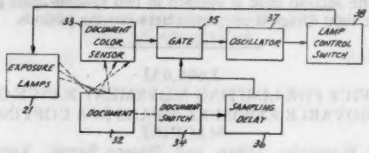


A slit exposure optical system having a fixed original to be copied and parallelly spaced advancing photocopying paper. A lens is located between the original and photocopying paper and is associated with two reflecting mirrors to transfer an image from the original to the photocopying paper. The lens and each reflecting mirror are movable at different related speeds to maintain the optical path between the lens and the original equal to the optical path between the lens and the photocopying paper.

3,609,038
ELECTRONIC CONTROL APPARATUS

Hajo A. Kolshorn, Marietta, Ohio, assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 9, 1970, Ser. No. 17,391
Int. Cl. G03b 27/74
U.S. Cl. 355—68 10 Claims

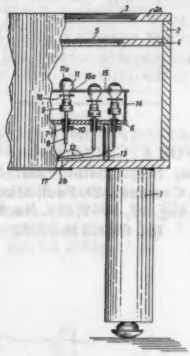


An electronic system for controlling light source intensity in document copying apparatus. Illumination for a photographic process is automatically varied in accordance with relative reflectivity characteristics of documents being advanced through the apparatus. A photoelectric device senses the amount of light energy reflected from such documents and this information is coupled to a circuit adapted to control energization of the illuminating lamps. The coupling circuitry includes an electronic switching device operatively connected to the output of a square wave generator having a duty cycle dynamically adjusted for modulating power to the lamps.

3,609,039
ILLUMINATING APPARATUS

Kasimir Ambraschka, Unterhaching, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 19, 1968, Ser. No. 776,961
Claims priority, application Germany, Nov. 30, 1967, 57,542
Int. Cl. G03b 27/54
U.S. Cl. 355—70 6 Claims



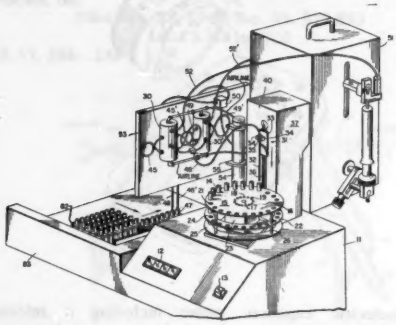
An illuminating assembly for illuminating an article such as a sheet located on a light-permeable support which forms a part of a structure used in connection with making microfilm photographs. The structure includes a light-permeable plate through which the light passes to reach the article which is to be illuminated, and on one side of this plate is situated a reflecting wall for reflecting light to the plate. A plurality of light sources extend at least in part to the side of the wall which is directed away from the plate, and a plurality of reflecting means respectively coact with the light sources for screening the latter against transmitting light directly to the plate while reflecting light therefrom to the wall to be reflected by the latter to the plate. An adjusting means is connected with the reflectors for adjusting the distance thereof with respect to the light-reflecting wall.

3,609,040

AUTOMATED SYSTEM FOR PERFORMING SAMPLE MEASUREMENTS, DILUTIONS AND PHOTOMETRIC MEASUREMENTS

Norbert R. Kuzel, and Frederick W. Kavanagh, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 24, 1969, Ser. No. 801,369
Int. Cl. G01n *1/00, 21/06, 1/10*
U.S. Cl. 356—36 6 Claims



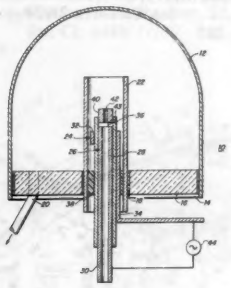
An automatic diluter and photometric reader adapted for use in the turbidimetric microbiological assays of antibiotics, vitamins, and the like, as well as in various other analytical assays.

3,609,041

LIQUID SAMPLE SPECTRAL SOURCE

Robert H. Webb, 104 Bertwell Road, Lexington, Mass., and Niels O. Young, Old Winter St., Lincoln, Mass.

Filed June 2, 1970, Ser. No. 42,729
Int. Cl. G01j *3/30, 3/34*
U.S. Cl. 356—85 27 Claims



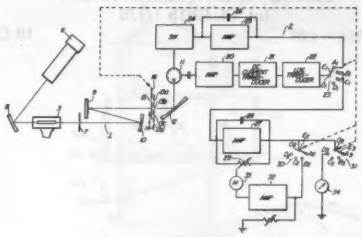
A method and device for generating spectral radiation characteristic of a liquid sample. An electrical voltage is applied to a body of conductive liquid, the voltage being in excess of the breakdown voltage of the vapor state of the liquid and causing a current sufficient to raise the temperature of the liquid to cause the liquid to vaporize and form a bubble. The bubble formed is sufficiently restricted so that the potential across the bubble can rise until electrical breakdown and an electrical discharge only across the bubble occurs.

3,609,042

OPTICAL MEASURING APPARATUS FOR SAMPLING MATERIAL, MAKING A FLAME TEST, AND COMPARING THE LIGHT FROM AN UNKNOWN CONCENTRATION WITH THAT FROM TWO KNOWN CONCENTRATIONS

Kazuo Yasuda; Koichi Uchino, and Hiroshi Inomata, all of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 9, 1969, Ser. No. 823,336
Claims priority, application Japan, May 13, 1968, 43/31647
Int. Cl. G01j *3/30, 3/48;* H01j *39/12*
U.S. Cl. 356—87 10 Claims



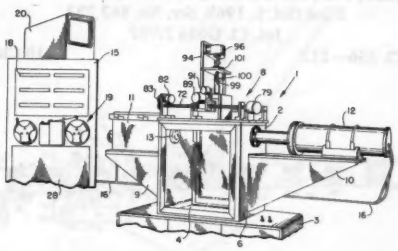
Optical measuring apparatus for sampling material in which a first and a second samples of known concentration and a third sample of which concentration is unknown but in between those of the first and the second samples are intermittently introduced in this order into a flame, light beams which pass through the flame being detected by a detector which in turn produces a first, a second and a third electric signals corresponding to the concentrations of the first, second and third samples, the third electric signal being compared with the first and the second signals and thereafter introduced into an indicating means.

3,609,043

SPRAY DROPLET ANALYZER

Harold C. Simmons, Richmond Hts., and John H. Gaag, Chesterland, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Nov. 19, 1968, Ser. No. 777,057
Int. Cl. G01n *15/02*
U.S. Cl. 356—102 14 Claims



Apparatus for analyzing fluid spray patterns for evaluation of characteristics of the spray and of the spray nozzle comprising a video system for counting the number of various size droplets in a specified view volume of the spray and a positioning and computer system cooperative with the video system for moving the nozzle to various positions and for performing a complete analysis of the fluid spray pattern. A three axis closed loop positioning system is used to control the instantaneous location of the fluid spray within a spray chamber and a conventional vidicon pick up tube receives images of fluid droplets at the particular view volume, the illumination being provided by an in-line xenon flash tube. Multiple readings of both the number and size of droplets in a particular view volume are made, the droplets being recognized by the intersection of the images with the scanning lines of the vidicon tube, and the averaged totals are retained in appropriate readout registers. The information of each view volume is recorded on paper tape together with the lo-

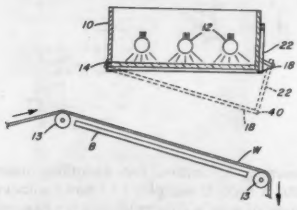
cation of the view volume for further computation and a complete analysis of the spray pattern. The spray chamber further includes a shield for the vidicon tube aperture wherein a continuous airflow prevents condensation of the fluid on the viewing glass.

3,609,044

APPARATUS FOR SELECTIVELY INSPECTING A WEB SURFACE AND A COATING ON THE SURFACE

Thomas J. Murphy, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 1, 1969, Ser. No. 838,177
Int. Cl. G01b *11/30*
U.S. Cl. 356—120 **10 Claims**



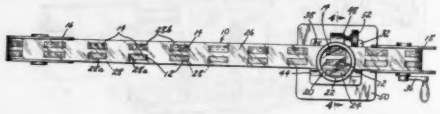
An apparatus for inspecting a specular surface and a coating on said surface. A reference pattern is so positioned with respect to the surface that a reflection of the pattern appears on the surface. A diffusion plate is located between the reference pattern and the surface and is movable between a first position wherein the reflection of the pattern on the surface has a high contrast for inspecting the surface to a second position wherein the reflection of the pattern on the surface is diffused for inspecting the coating.

3,609,045

APPARATUS FOR STORING AND VISIBLY COMPARING THE OPTICAL PROPERTIES OF MINATURE SAMPLES

Kurt Stein, 105 Pinehurst Ave., New York, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,793
Int. Cl. G01n *21/02*
U.S. Cl. 356—212 **10 Claims**



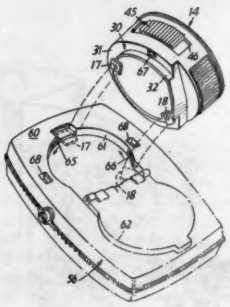
Apparatus for storing a plurality of samples having known optical properties and for displaying and samples in a manner wherein the latter may be readily compared with an unknown sample for matching color or other optical properties of the latter comprises a flexible, elongated carrier tape upon which known microsamples are mounted. The tape is fed to a viewing station at which a magnifier or microscope is utilized to view the known samples simultaneously with an unknown sample which is disposed in a fixed position in the viewing station. Indicia means on the carrier tape, and associated with each known sample is also located within the viewing station, so that when the carrier tape is moved until a known sample matches the unknown sample, the indicia means, viewed through the magnifier, identifies the color or other optical properties of the matched samples.

3,609,046

PHOTOELECTRIC EXPOSURE METERS

Gerhart Lothar Hamburger, Welwyn, England, assignor to Sangamo Weston Limited, Enfield, Middlesex, England

Filed June 23, 1969, Ser. No. 835,682
Claims priority, application Great Britain, June 25, 1968, 30307/68
Int. Cl. G01j *1/42, 1/44*
U.S. Cl. 356—222 **18 Claims**



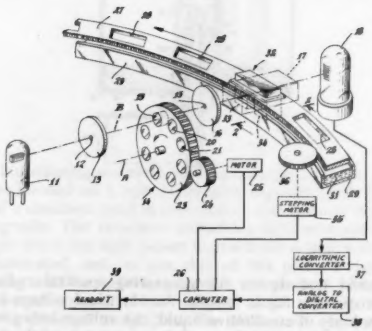
Photoelectric exposure meter including a selenium photocell coupled to an electrical measuring instrument calibrated in light values and a separate attachment including a second, cadmium sulfide type of photocell and a battery for extending the measuring range to lower light values, said attachment being mountable over the selenium cell on the exposure meter by a bayonet-type fixing including contact plates which engage other contacts on the exposure meter to couple the second cell to the measuring instrument whereby the latter is operated by current derived from the second photocell. A transistor amplifier is included in the attachment together with switching means in which the single-mercury cell battery forms the movable switch contact.

3,609,047

SINGLE BEAM PHOTOMETER SYSTEM WHEREIN THE ABSORBANCE OF A SAMPLE IS DETERMINED RELATIVE TO A REFERENCE

Douglas G. Marlow, Arcadia, Calif., assignor to Xerox Corporation, Rochester, N.Y.

Filed Mar. 2, 1970, Ser. No. 15,536
Int. Cl. G01n *21/24*
U.S. Cl. 356—205 **8 Claims**



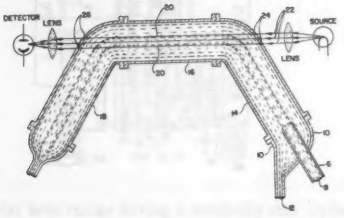
A single beam photometer system for measuring the differential optical absorbance of a sample with respect to a reference. The sample and the reference are held in a two compartment container. A rotating transport wheel driven by

a stepping motor is utilized to move the container so as to pass the sample and the reference through a light beam in succession. The intensity of the light transmitted through the sample and the reference is measured by a photocell. The output from the photocell is fed into an electronic system which produces an output signal corresponding to the differential optical absorbance of the sample with respect to the reference.

3,609,048
SELF CLEANING SAMPLE CELL FOR RADIANT ENERGY ANALYZERS

Allen Strickler, Fullerton, Calif., assignor to Beckman Instruments, Inc.

Filed Nov. 25, 1969, Ser. No. 879,883
Int. Cl. G01n *1/10*
U.S. Cl. 356—246 **1 Claim**

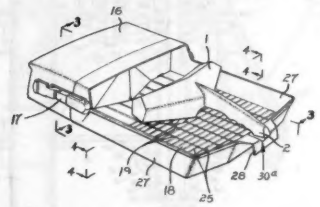


There is disclosed a self-cleaning flow-through sample cell through which a sample fluid is conducted for analysis in a radiant energy analyzer. A fluid-combining assembly is provided to establish laminar flow of a carrier fluid in a sheath around a core of sample fluid. A conduit is connected to the fluid combining assembly to conduct and maintain the laminar flow. Windows are provided in the walls of the conduit to establish a path for radiant energy used for analysis of the sample fluid core. The sheath of carrier fluid prevents contamination of the window areas by the sample fluid.

3,609,049
HAND SHAMPOO AND SUPPLY TRAY

Donald Nation Smyth, South Plympton, South Australia, Australia, assignor to S. A. Brush Company Limited, Albert Park, South Australia, Australia

Filed Nov. 4, 1969, Ser. No. 873,814
Claims priority, application Australia, Nov. 22, 1968, 46690
Int. Cl. A46b *11/00*
U.S. Cl. 401—118 **10 Claims**

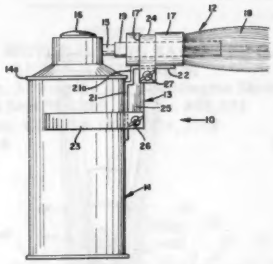


A hand-operated shampoo device for cleaning fabrics or the like comprising in combination a body arranged to be hand held and having on it rolling members on axles which are at an angle to the direction of travel of the said body as it is swept across the surface, the angular disposition resulting in a shearing action between the rolling members and the surface, there being means to apply fluid to the rolling members comprising a tray having a floor which is channelled or shaped to hold a small volume of a foaming liquid supplied to the floor, rolling members when engaged on the floor and rolled on same causing the liquid to foam and thus charging the rolling members with foam rather than a quantity of liquid.

3,609,050
SHAVING LATHER APPLICATOR

Warren V. Alexander, 922 W. Vanderbilt, Stephenville, Tex.

Filed Aug. 5, 1969, Ser. No. 847,634
Int. Cl. A46b *11/02*
U.S. Cl. 401—190 **2 Claims**

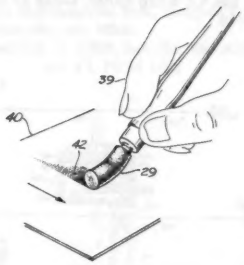


A fountain brush supported on an aerosol container of shaving lather by removable attachment means so that the outlet nozzle of the container discharges into a lather supply tube extending into the bristles of the brush. The attachment means consist of an angle bracket with clamp means on one arm to embrace the container and second clamp means on its other arm to support the brush.

3,609,051
ARTISTS SPIN BRUSH

Ben Braun, 15 Georgie Drive, Syosset, N.Y.

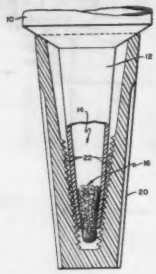
Continuation-in-part of application Ser. No. 600,556, Dec. 9, 1966, now abandoned. This application Oct. 13, 1969, Ser. No. 865,939
Int. Cl. B44d *3/28*
U.S. Cl. 401—197 **9 Claims**



According to the present invention, a rotatable brush for combining the tactile qualities of a roller with that of a conventional brush is characterized primarily in that a brush is provided means whereby the tip is made rotatable relative to the holder and adapted to be selectively bent by hand pressure against a drawing surface and rollably moved therealong to produce a stroke of desired width. It comprises, in combination, a hand grip holder having a longitudinal compartment therewithin open at one end; a spindle assembly composed of a spindle, a flexible brush tip disposed about one end thereof, the rest of the spindle rotatably mounted in the hand grip holder. An optional feature of the present invention is the use of an internal feed which further comprises an ink reservoir, an internal passage communicating with the reservoir, a valve means intermediate the tip and internal passage which is operative with the flexure and rotation of

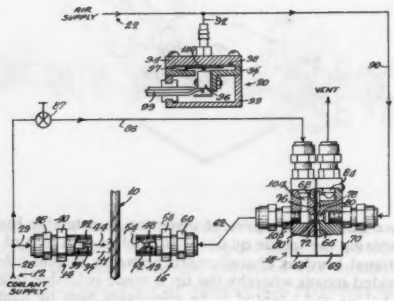
the tip for feeding ink thereto, and a vent means extending into the free end of the passage to facilitate, by tongue means, the movement of liquid and air in opposite directions.

3,609,052
FLUID DISPENSING
A. Albert Airosus, 39 Crosby St., Lowell, Mass.
Filed Feb. 17, 1969, Ser. No. 799,612
Int. Cl. B43k *5/10*
U.S. Cl. 401—199 2 Claims



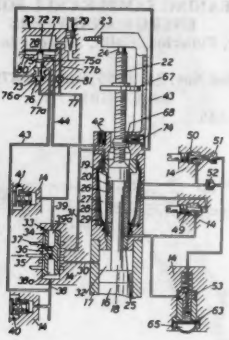
A marking or writing instrument in which the nib is fabricated from extremely fine, hairlike stainless steel fibers which are arranged in a random, compact bundle. The bundle is located within and protrudes outwardly of an outlet orifice formed in the flexible tip of the container in which the marking fluid is stored. A closure cap having tapered, internal threads screws onto the flexible tip of the marker to compress the tip and closes the interstices between the fibers of the nib contained therein to seal the orifice.

3,609,053
BROKEN TOOL DETECTOR
Richard F. Klem, Wheaton, Ill., assignor to ITE Imperial Corporation
Filed Apr. 29, 1969, Ser. No. 820,094
Int. Cl. B23b *49/00*; G01d *21/00*
U.S. Cl. 408—16 4 Claims



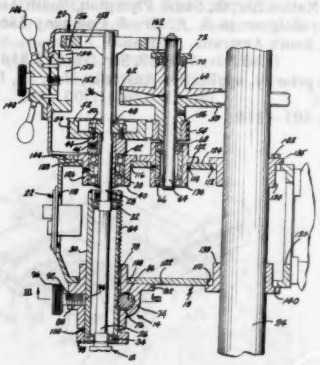
A coolant and broken tool detecting circuit wherein the coolant for the tool is detected when the tool breaks. The circuit includes a supply nozzle for directing coolant against the tool and a receiver nozzle on the opposite side of the tool which receives coolant when the tool is broken. There is provided a diaphragm sensor communicating with the receiver nozzle for sensing pressure changes therein and indicating when the tool is broken, and there being also provided a supply of liquid to the receiver nozzle continuously for the purpose of purging the receiver nozzle of any contamination.

3,609,054
POWER OPERATED DRILLING UNIT
Bengt Ebbe Harald Nyman, Rockford, Ill., assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Sept. 3, 1969, Ser. No. 854,942
Claims priority, application Sweden, Sept. 10, 1968, 12128/68
Int. Cl. B23b *39/10*, *47/22*
U.S. Cl. 408—17 9 Claims



A step drilling unit is provided. It has a power means for feeding and retracting a drill. Each step of drilling is timed by a pneumatic timing device which vents a control passage of an air-distributing valve so that the valve shifts from a position for effecting feed movement to a position for effecting retraction.

3,609,055
DRILL PRESS
Andrew C. Luff, 2025 Chevy Chase Blvd., and John E. Barnett, 747 Keenway Circle, both of Kalamazoo, Mich.
Filed Mar. 11, 1969, Ser. No. 806,251
Int. Cl. B23b *39/00*, *47/00*
U.S. Cl. 408—135 11 Claims

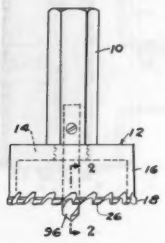


This disclosure relates to a drill press having a quill assembly, a drive shaft, and a support column fixed to a central lightweight cast housing through flanged collars. The top and bottom surfaces of the central housing are machined flat and parallel. The flange collar surfaces in contact with the top and bottom of the central housing are also machined flat and at right angles to the bore to mate with the machine surfaces of the case housing to thereby ensure precise alignment of the quill assembly, drive shaft and support column within the cast housing, and to provide an inexpensive way of replacing worn parts.

The quill assembly has a longitudinal vertical bore in which the quill slides. A pressure screw abuts the quill to lock the same in any desired position.

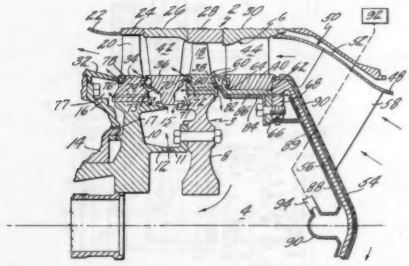
A positive drive is provided to the drive shaft by the use of a gear belt which is connected to a power source through a variable drive mechanism.

3,609,056
HOLE CUTTER
Everett D. Hougen, 6956 N. Odell Ave., Chicago, Ill.
Filed June 5, 1969, Ser. No. 830,650
Int. Cl. B23b *51/04*
U.S. Cl. 408—204 **29 Claims**



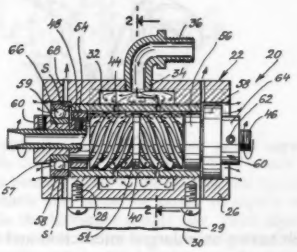
An annular hole cutter having a relatively thin, cylindrical sidewall with a plurality of teeth formed in the thickened lower edge thereof. The teeth have cutting edges extending across the full width of the thickened edge. The cutting edges have two radially inclined portions which intersect in a crest so as to cut a V-shaped groove. An upwardly and radially outwardly inclined gullet is formed between successive teeth, the gullet opening at its upper end into an annular chip clearance space in the groove above the thickened edge of the sidewall.

3,609,057
TURBINE COOLANT FLOW SYSTEM
Leland J. Radtke, North Palm Beach, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed June 15, 1970, Ser. No. 46,366
Int. Cl. F01d *1/04, 5/06;* **F03b** *11/00*
U.S. Cl. 415—59 **8 Claims**



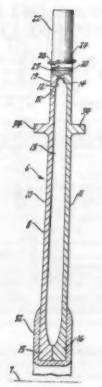
A two-stage turbine is disclosed having a vane upstream of a first stage turbine and a vane between the two turbine stages. A hot gas flows into the turbine from a hot gas generator and it exhausts from an exit end. Sealing means are provided between the rotating turbines and the fixed structure forming the inner side of the annular hot gas flow passage through the turbine. A chamber is formed adjacent the sealing means at the inlet to the first stage turbine. A coolant is directed to said chamber with the pressure regulated so that in operation fluid will flow inwardly through the sealing means from the hot gas flow passage to said chamber. The fluid mixture from the chamber passes to the rear side of the turbine disk where the pressure is now greater than the pressure in the hot gas flow passage so that at the sealing means at the rear side of the first stage turbine the coolant flows into said passage. In the second stage turbine, the pressures of the coolant and hot gases are such that the coolant flows outwardly into the hot gas flow passage. A dome-shaped manifold receives coolant from a supply and directs it through passageways to the chamber. The sizing of the sealing means at various locations controls the amount of leakage flow. The invention herein described was made in the course of or under a contract with the Department of the Air Force.

3,609,058
TURBINE MOTOR HAVING BALANCED GAS LUBRICATED ROTOR
Balazs K. Tarsoly, 32 Engelke Ave., Huntington Station, N.Y.
Filed Sept. 8, 1969, Ser. No. 855,933
Int. Cl. F01d *3/00, 3/04, 5/08*
U.S. Cl. 415—104 **6 Claims**



A gas-driven motor has a cylindrical rotor provided with helical vanes. The rotor has end bearings which are lubricated and cooled by spent gas passing out of opposite ends of the rotor. Pressurized gas is fed to a stationary cylindrical housing in which the rotor is mounted. In the housing the gas is distributed circumferentially around the rotor by a cylindrical manifold.

3,609,059
ISOTHERMAL WHEEL
Joseph A. Wagle, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Oct. 3, 1969, Ser. No. 863,638
Int. Cl. F01d *5/08*
U.S. Cl. 416—95 **3 Claims**



A rotor wheel for a compressor operating at relatively high temperatures is made up of two disks enclosing a cavity

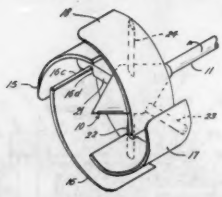
between them and mounting blades at the rim of the wheel. A scoop tube projecting into the air path deflects air into the cavity within the wheel, within which it circulates and is exhausted near the rim of the wheel at the lower pressure face of the wheel. The circulating air reduces temperature gradients between the hot rim and the hub portion of the wheel.

3,609,060

MARINE PROPELLER

Alberto Angel, 8606 Morley, Houston, Tex.

Filed July 14, 1969, Ser. No. 841,345
Int. Cl. B63h *1/16*
U.S. Cl. 416—179 **8 Claims**



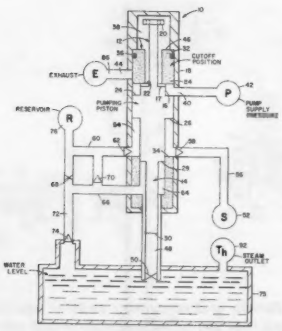
A hub having an enlarged midsection and tapered forward and rearward portions is adapted to be attached to a propeller drive shaft. A plurality of outwardly extending arm members support a plurality of curved blades in a spaced-apart manner from the hub. The blades are positioned for squeezing water inwardly toward the rotational axis of the propeller during rotation of the propeller for increasing the water pressure adjacent the rearward portion of the hub for producing a desired forward thrust for the propeller.

3,609,061

AUTOMATIC LIQUID LEVEL CONTROL SYSTEM

Jerry A. Peoples, 2419 Greenhill Drive N.W., Huntsville, Ala.

Filed Jan. 7, 1969, Ser. No. 789,543
Int. Cl. F04b *49/00*, *35/00*
U.S. Cl. 417—36 **7 Claims**



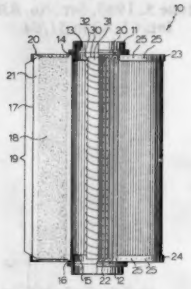
A reciprocating, gas-driven, direct-acting, pumping system for maintaining a predetermined liquid level in a pressure vessel.

3,609,062

GETTER PUMP

Mario Zucchinelli, and Bruno Ferrario, both of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Oct. 14, 1969, Ser. No. 866,336
Claims priority, application Italy, Oct. 28, 1968, 844739/68
Int. Cl. F04b *37/02*; H01k *1/52*
U.S. Cl. 417—48 **7 Claims**



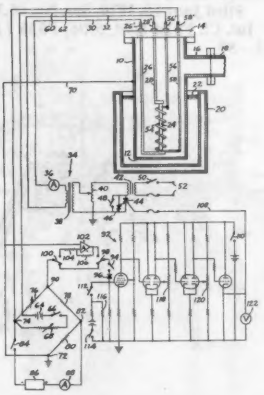
A getter pump having a central axis and a nonevaporable getter material coated on a radially folded substrate. These pumps are useful for producing and maintaining vacuum in closed vessels wherein they sorb active gases.

3,609,063

SUBLIMATION PUMP AND METHOD OF REGULATING IT

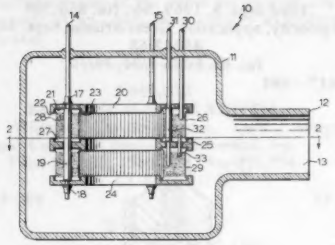
Thomas A. Jennings, Sutton Coldfield, England, assignor to Hull Corporation, Hatboro, Pa.

Filed Mar. 6, 1970, Ser. No. 17,158
Int. Cl. F04b *37/02*
U.S. Cl. 417—51 **9 Claims**



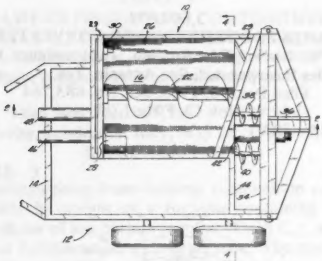
In a sublimation pump the cooled gas-adsorbing metal surface of the pump cylinder and a heated metal filament are made the anode and cathode, respectively, of a space-charged limited current diode which is included in a bridge circuit for detection of changes in its current-voltage characteristics. Potential differences across the bridge circuit resulting from changes in extent of adsorption of gas and deposition of vaporizable metal on the anode are amplified and utilized to control the source which effects heating of the vaporizable metal in the cylinder.

3,609,064
GETTER PUMP WITH DIRECT RESISTANCE HEATING OF GETTER STRIP
Tiziano A. Giorgi, and Bruno Ferrario, both of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy
Filed Nov. 21, 1969, Ser. No. 878,812
Int. Cl. F04b *37/02*; B01d *53/26, 39/00*
U.S. Cl. 417—51 11 Claims



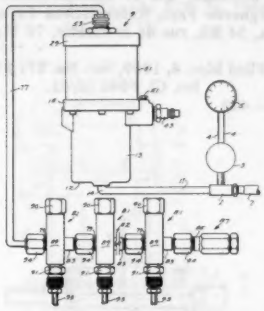
A getter pump comprising a substrate of high ohmic resistance; a nonevaporable getter material embedded in the substrate; and means for causing an electrical current to flow through the substrate.

3,609,065
CONCRETE PUMP
Francis C. Wilson, 8330 N. Poplar Drive, Milwaukee, Wis.
Filed Aug. 19, 1969, Ser. No. 851,348
Int. Cl. F04b *23/14*
U.S. Cl. 417—203 10 Claims



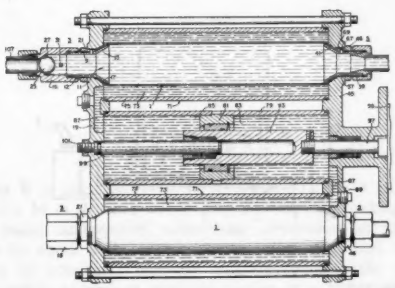
Concrete mix is power fed into two concrete cylinders having pistons operating in timed reciprocation with a discharge tube which swings into alignment with the cylinders so that as the concrete in one cylinder is being forced into the discharge tube, the other cylinder is being filled. The discharge tube is disposed between two power infeed screws which swing with the tube so that one of the screws is aligned with one of the cylinders while the other cylinder is being emptied.

3,609,066
LUBRICANT INJECTION SYSTEM
Jerome B. Wegmann, St. Louis County, Mo., assignor to McNeil Corporation, Akron, Ohio
Filed Nov. 13, 1969, Ser. No. 876,358
Int. Cl. F04b *17/02*; F16n *7/34*
U.S. Cl. 417—344 10 Claims



A lubricant supply line from a lubricant pump supplies a number of serially connected injectors, each of which has a connection with a bearing to be lubricated. A timing arrangement cyclically starts and stops the pump to supply and to release pressure in the lubricant supply line. Each injector is constructed so that, when the inlet pressure thereto rises, an accurately measured amount of lubricant is forced to its bearing connection and the risen inlet pressure is serially applied to the next injector in the series so that it subsequently forces a like measured amount of lubricant to its bearing connection. An accumulator is connected to the outlet of the last injector and becomes operative after the last injector has functioned. Thereafter the pump stops to release built-up pressure which causes serial recharging of the injectors to ready them for accurately measured lubrication during the next cycle. During this recharging event, only the first injector returns a relatively small amount of lubricant to the pump and each injector receives its recharge from the next one, except the last one which receives its recharge from the accumulator. The accumulator also serves as a malfunction indicator for the system.

3,609,067
DOUBLE-ACTING PUMP
Allen C. Wright, Moraga, Calif., assignor to Utility Products, Inc.
Filed Dec. 18, 1969, Ser. No. 886,313
Int. Cl. F04b *35/02*
U.S. Cl. 417—389 7 Claims



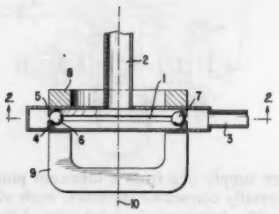
A double acting pump for abrasive or like material, involving a pair of flexible tubes, each adapted to be cyclically

pulsed by surrounding pump fluid which is flow connected to a pump fluid chamber, the pulsing being alternately accomplished by a reciprocal displacement piston, which, when reciprocated, alternately displaces pump fluid in the pump fluid chambers.

3,609,068
CENTRIFUGAL PUMP

Rene Fays, deceased, late of Maisons-Laffitte, France (by Reine Marguerite Fays, Renee Helene Fays, Rolande Jose Fays, heirs, 34 Bis, rue de la Muette, 78 Maisons-Laffitte, France)

Filed Mar. 4, 1969, Ser. No. 871,814
Int. Cl. F04d *13/02*
U.S. Cl. 417—420 **15 Claims**

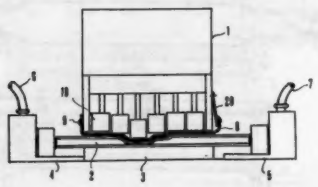


Disclosed herein is a centrifugal pump having a sealed circular chamber and an annular raceway in the chamber adjacent the periphery thereof. Roller elements are freely positioned within said raceway and these roller elements are rotated on the raceway by a rotating magnetic field positioned outside the chamber. An inlet near the center of the chamber administers fluid to the pump which centrifugally forces the fluid out an outlet adjacent the periphery of the chamber by the rotation of the roller elements.

3,609,069
PERISTALTIC PUMP FOR CONVEYING LIQUIDS IN CHEMICAL APPARATUS

Alfred Martinelli, Zurich, Switzerland, assignor to Polymetron Ltd., Glattbrugg, Switzerland

Filed Nov. 17, 1969, Ser. No. 877,300
Claims priority, application Switzerland, Mar. 21, 1969, 4279/69
Int. Cl. F04b *43/08, 43/12, 45/06*
U.S. Cl. 417—474 **6 Claims**

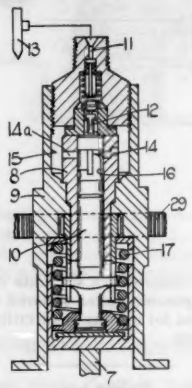


A peristaltic pump for conveying liquids in chemical apparatus having a plurality of plungers. A flexible layer of a material such as polytetrafluorethylene is arranged under tension between the plungers and the hoses containing the liquid to be pumped. The flexible layer of material adapts itself to the level of the surfaces of the individual plungers and, thereby increases the service life of the hoses.

3,609,070
FUEL INJECTION PUMPS

Stanley Robert Bagshaw, Hemel Hempstead, England, assignor to C.A.V. Limited, Warple Way, Acton, London, England

Filed Sept. 9, 1969, Ser. No. 856,369
Claims priority, application Great Britain, Sept. 24, 1968, 45242/68
Int. Cl. F04b *7/04, 39/10*
U.S. Cl. 417—494 **1 Claim**

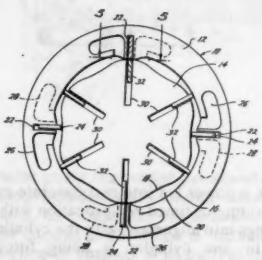


A fuel injection pump includes a pump barrel in which is reciprocably mounted a plunger which has a helical or like groove communicating with a pumping chamber defined at the end of the plunger, there being provided in the pump barrel a spill port through which fuel can escape from the pumping chamber when the port is exposed by the groove, the spill port being formed in such a manner as to define a wall which is presented to the flow of fuel through the spill port whereby the velocity of such flow is minimized.

3,609,071
VANES FOR FLUID POWER CONVERTER

Robinson W. Brown, San Antonio, Tex., assignor to United Hydraulics Incorporated, San Antonio, Tex.

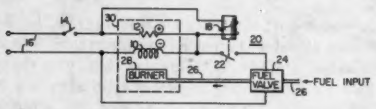
Filed Dec. 10, 1969, Ser. No. 883,764
Int. Cl. F01c *1/00*
U.S. Cl. 418—221 **9 Claims**



A self-pressurizing reversible vane for use in a fluid pump or motor in which the width of the vane in a radial cross sec-

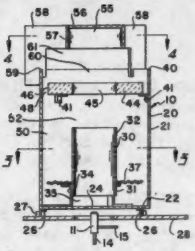
tion is less than the width of the slot thereby allowing fluid pressure to flow into the vane-receiving slot and around the vane to act on the bottom of the vane to provide a self-loading action. The vane having sides contoured to coact with and seal with the sides of the slot and freely movable sideways in the slot thereby allowing the pump or motor to reverse. A vane being teardrop shaped in cross section and having straight sides with rounded ends with the small end extending out of the slot thereby reducing the friction of the pressure-loaded vane. In fluid motors and pumps having vane valve elements in both the stator and rotor interaction noise and interference between the vanes may be reduced by placing the longitudinal axis of the vanes on at least one of the rotor and stator at an angle to a radially extending plane through the axis.

3,609,072
ELECTRIC IGNITER SYSTEM
James R. Willson, Garden Grove, Calif., assignor to Robertshaw Controls Company, Richmond, Va.
Filed July 30, 1969, Ser. No. 845,954
Int. Cl. F23n *5/14*
U.S. Cl. 431—66 **13 Claims**



An electric igniter system for a fuel burner including an electrical resistance type igniter, wherein the resistance element is of a type having a negative temperature coefficient and is coupled to a thermistor having a positive temperature coefficient. An electrically operated fuel valve is energized only after the igniter and thermistor resistances have been changed by heat from the igniter to values corresponding to the generation of fuel ignition temperatures by the igniter.

3,609,073
OIL BURNER APPARATUS
Edgar C. Robinson, North Vancouver, British Columbia, Canada, assignor to Dickinson's Limited, Burnaby, British Columbia, Canada
Filed Feb. 24, 1969, Ser. No. 801,445
Claims priority, application Canada, Feb. 26, 1968, 013,330
Int. Cl. F23l
U.S. Cl. 431—116 **22 Claims**



A fuel pump unit and burner combination, an air oil mixture being recirculated vertically upwards through a central blast chamber of said burner from there outwardly and downwardly through a surrounding chamber and then again through said blast chamber for preheating prior to combustion, a refractory ring and inversion cap being positioned in the surrounding chamber and spaced above the blast chamber said unit having means for delivering only low pressure primary air and oil at atmospheric pressure to said burner.

CHEMICAL

ERRATA

For Classes 44—62 and 44—69 see:
Patent Nos. 3,608,231 and 3,608,232

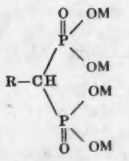
3,609,074
FLAME-EXTINGUISHING COMPOSITIONS COMPRISING 1,2-DIBROMO-TETRAFLUOROETHANE
Nicolino Rainaldi, Mestre, and Pierluigi Fatutto, Venezia, both of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy
Filed May 26, 1969, Ser. No. 827,959
Claims priority, application Italy, May 28, 1968, 17,004 A/68
Int. Cl. A62d *1/00*
U.S. Cl. 252—3 **5 Claims**

Flame-extinguishing foam-forming composition containing 5–25 percent by weight of a bromine-containing halogen-saturated alkane of low carbon number (C_1 to C_6), preferably symmetrical 1,2-dibromotetrafluoroethane. The composition also contains substances conventional in foaming, liquid, flame-extinguishing compositions, e.g., water, emulsifiers or foam-stabilizing surface-active agents, propellants, antifreezing liquids, corrosion inhibitors, buffer substances, thickening and carrying agents.

3,609,075
CLEANING AND SOFTENING DETERGENT COMPOSITIONS
Melvin A. Barbera, Mount Healthy, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed June 25, 1968, Ser. No. 739,631
Int. Cl. D06m *13/28;* **C11d** *3/065*
U.S. Cl. 252—8.6 **11 Claims**

Detergent compositions containing a synthetic organic nonsoap detergent and an organo-phosphorus softener compound which provide conjoint cleaning and softening properties are described. The organo-phosphorus compounds employed in an amount of about 1 to 15 percent of the composition include alkylphosphinic compounds having the formula

wherein R is alkyl of about 12 to 30 carbon atoms, R^1 is hydrogen or alkyl of one to about 30 carbon atoms, and M is a water-solubilizing cation, e.g., hydrogen, alkali metal, ammonium or substituted-ammonium or alkyl of about one to about eight carbon atoms; and alkyldiphosphonic compounds having the formula



wherein R is alkyl of about 12 to about 30 carbon atoms and each M is a water-solubilizing cation, e.g., hydrogen, alkali metal, ammonium, substituted ammonium or alkyl of one to about eight carbon atoms. Also disclosed is a process of conjointly washing and softening textile materials which comprises washing textiles at a temperature of about 40° to about 180° F. with an aqueous solution of a detergent composition of the present invention, said solution having at least about 16 p.p.m. of the organo-phosphorus softener compound.

3,609,076

METHOD OF PREPARING OVER-BASED ALKALINE EARTH SULFONATES

Albert R. Sabol, Munster; Eli W. Blaha, Highland, and Cecil G. Brannen, Highland, all of Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed Oct. 15, 1968, Ser. No. 767,833
Int. Cl. C10m *1/40, 1/24, 1/10*
U.S. Cl. 252—33.3 8 Claims

Overbased, i.e., highly basic, alkaline earth sulfonates are prepared by reacting a preferentially oil-soluble sulfonic acid with a basic alkaline earth compound in the presence of small amounts of an ammonium salt of a C_1 to C_7 aliphatic acid.

3,609,077

LUBRICANT COMPOSITIONS

Walter V. Breitigam, Wood River, and Hans Low, East Alton, both of Ill., assignors to Shell Oil Co., New York, N.Y.

Filed Nov. 18, 1968, Ser. No. 776,776
Int. Cl. C10m *1/46*
U.S. Cl. 252—32.5 4 Claims

Novel haloalkyl substituted pyrophosophonic acid derivatives and their amine salts impart, inter alia, extreme-pressure properties to lubricant compositions especially to lubricant compositions used in gas-turbine engines.

3,609,078

CORROSION INHIBITED GREASE COMPOSITION

Donald D. Carlos, Crown Point, Ind.; Robert H. Jordan, Chicago Heights, and Thomas H. Webb, Hazel Crest, Ill., assignors to Atlantic Richfield Company

Filed Aug. 13, 1968, Ser. No. 752,188
Int. Cl. C10m *1/54;* C09k *3/00*
U.S. Cl. 252—40.7 19 Claims

Corrosion and rust inhibitors for lubricating greases are prepared by Friedel-Crafts-catalyzed interpolymerization of a mono-1-alkene, an olefinically unsaturated carboxylic acid (or ester thereof) wherein the olefinic bond is at least 2 carbon atoms away from the carboxyl group and, optionally, a conjugated diene hydrocarbon. Preferably, the mono-1-alkene is normal and has about 14 to 21 carbon atoms, the unsaturated acid has about 10 to 21 carbon atoms and, if the ester is used, is esterified with a lower alkanol, and the diene has 4 to 5 carbon atoms. The corrosion and rust inhibitors for lubricating greases are prepared by condensation of these polymers with an essentially aliphatic polyamine having up to about 11 amino groups, at least one of which is primary, e.g., pentaethylene hexamine.

3,609,079

SILICONE LUBRICANTS

Martin J. Devine, 2560 Prescott Road, Havertown, Pa., and Edward R. Lamson, Greentree Road, R.D. 4, Sewell, N.J.

Filed Dec. 13, 1968, Ser. No. 783,537
Int. Cl. C10m *1/52, 1/50, 1/38*
U.S. Cl. 252—46.3 6 Claims

Lubricant compositions having increased lubricity are obtained by forming a mixture of a major amount of a silicone lubricant and a minor amount of a sulfur containing compound dissolved in the silicone and including at least two sulfur atoms per molecule. According to a preferred form of the invention, from 1 to 10 parts by weight of di-tertiary-nonyl polysulfide are admixed with from 99—90 parts by weight of a silicone oil to provide a new composition which functions properly as a lubricant under loads as high as 240 kilograms when employing the Shell 4-Ball EP machine. Without the polysulfide additive, the silicone oil is not useful as a lubricant under loads exceeding about 40 kilograms when employing the Shell 4-Ball EP machine.

3,609,080

LUBRICANT, GREASE AND HYDRAULIC FLUID

Joachim Dazzi, Riehen/Basle, Switzerland, assignor to Geigy Chemical Corporation, Ardsley, N.Y.

Filed May 26, 1969, Ser. No. 827,880
Claims priority, application Switzerland, May 29, 1968, 7972/68
Int. Cl. C10m *1/38, 1/32*
U.S. Cl. 252—47.5 8 Claims

Lubricants, greases and hydraulic fluids are described which consist of, or comprise as an essential constituent substituted imidazolidin-2-ones or pyrimidin-2-ones.

A preferred lubricant contains 69 percent to 77 percent of N,N′-didodecylimidazolidin-2-one and 31 percent to 23 percent of N,N′-di-octyl-5-methylimidazolidin-2-one.

3,609,081

ORGANIC COMPOSITIONS CONTAINING SECONDARY C_6 TO C_9 TRIALKYL PHENOLS, OR THEIR MIXTURES, AS ANTIOXIDANTS

Harry J. Andress, Jr., Pitman, N.J., assignor to Mobil Oil Corporation

Continuation-in-part of application Ser. No. 710,784, Mar. 6, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 556,577, June 19, 1966, now abandoned , which is a continuation-in-part of application Ser. No. 510,395, Nov. 29, 1965, now abandoned. This application Oct. 17, 1969, Ser. No. 867,369
Int. Cl. C10m *1/20*
U.S. Cl. 252—52 10 Claims

Organic compositions are provided containing secondary C_6 to C_9 trialkyl phenols, or their mixtures, as antioxidants for preventing oxidative deterioration of metal surfaces.

3,609,082

ELECTROSTATIC DEVELOPER PARTICLES CONTAINING RESIN, COLORANT, METAL SALT AND PHTHALATE

Joseph H. Moriconi, Rochester; Frank M. Palermiti, Pittsford, and Burton B. Jacknow, Rochester, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 5, 1967, Ser. No. 643,396
Int. Cl. G03g *9/02*
U.S. Cl. 252—62.1 10 Claims

A finely divided toner comprising a colorant, a thermoplastic resin comprising a vinyl resin, a solid ester of o-phthalic or m-phthalic acid and a solid metal salt of a fatty acid.

3,609,083

HEAT TREATMENT OF NICKEL ZINC COBALT FERRITE

Paul Irving Slick, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 684,628, Nov. 21, 1967.
Filed Mar. 17, 1970, Ser. No. 20,416
Int. Cl. C04b *35/30*
U.S. Cl. 252—62.62 8 Claims

This is a method for improving the magnetic properties, and in particular the product of the permeability and the quality factor, for a nickel zinc cobalt ferrite, within the frequency range of 1.5 to 20 megahertz. It is a heat treatment consisting of the steps of; precooling, comprising either rapid cooling or cooling in an oxygen-poor atmosphere to a temperature above the Curie point and thereafter slowly cooling to room temperature in an oxygen-rich atmosphere. The resulting product is useful as a core material in inductors at high frequency.

3,609,084

LITHIUM FERRITE COMPOSITION FOR MAGNETIC MEMORY ELEMENTS AND MANUFACTURING PROCESS THEREOF

Norbert Loye, Montreuil-Sous-Bois, France, assignor to Compagnie Des Ferrites Electroniques-Cofelec, Paris, France

Filed May 15, 1968, Ser. No. 729,430
Claims priority, application France, May 18, 1967, 106,813
Int. Cl. C04b 35/26
U.S. Cl. 252—62.59 4 Claims

A composition comprising by mole percent:

Fe_2O_3: 50 to 80 percent; Li_20: 8 to 18 percent, at least one oxide chosen from the following group: MgO, $A1_2O_3$, CaO, Cr_2O_3, NiO, CuO, ZnO, CdO: 0 to 10 percent; Mn0: 0 to 40 percent; SiO_2 up to 5 percent. The temperature of 1,200° C. is never exceeded in the course of the preparation.

The Curie point is above 500° C.

3,609,085

POLYESTER FUNCTIONAL FLUID COMPOSITIONS

Frank H. Langenfeld, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 682,546, Nov. 13, 1967, now Patent No. 3,573,097, which is a continuation-in-part of application Ser. No. 516,077, Dec. 23, 1965, now abandoned. This application Mar. 16, 1970, Ser. No. 20,103
Int. Cl. C09k 3/00; C10m 3/20; C23f 11/08
U.S. Cl. 252—79 8 Claims

Compositions comprising a synthetic ester hydraulic fluid and a small amount of water exhibit the ability and control damage to mechanical members in contact with said compositions. The compositions have many uses, among which are their use as hydraulic fluids.

3,609,086

ARSENIC TRIOXIDE CORROSION INHIBITOR FOR ABSORPTION REFRIGERATION SYSTEM

Robert J. Modahl, Galesville, and Paul J. Lynch, La Crosse, both of Wis., assignors to The Trane Company

Division of Ser. No. 744,913.
Filed Sept. 15, 1969, Ser. No. 872,802
Int. Cl. C09k 3/06; C23f 11/18
U.S. Cl. 252—68 6 Claims

Evolution of hydrogen and corrosion of iron and copper construction materials in a closed, substantially anaerobic refrigeration system of an absorption refrigeration machine is successfully controlled by addition of an arsenic trioxide inhibitor to the lithium bromide absorbent solution. The absorbent solution is maintained at a basicity of from 0.1N to 0.5N based on a 60 percent lithium bromide solution.

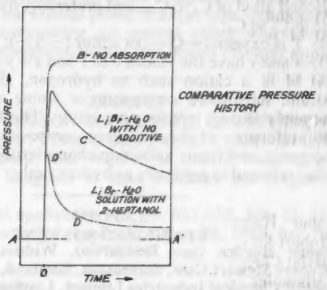
3,609,087

SECONDARY ALCOHOL ADDITIVES FOR LITHIUM BROMIDE-WATER ABSORPTION REFRIGERATION SYSTEM

Chang W. Chi, Chicago; Robert A. Macriss, Deerfield, and William F. Rush, Arlington Heights, all of Ill., assignors to The American Gas Association, Inc.

Filed Feb. 1, 1968, Ser. No. 702,294
Int. Cl. C09k 3/06
U.S. Cl. 252—69 5 Claims

A refrigerant-absorbent solution as a working fluid for use in absorption refrigeration systems that produces a substantial increase in the overall capacity of the refrigeration machine by improving the heat transfer in the absorber, by promoting dropwise condensation of the refrigerant vapor on the exterior surfaces of the condenser tubes and by improving purging of relatively noncondensible gases of the absorption machine. The working fluid comprises water as the refrigerant in combination with lithium bromide as the absorbent to which is added additives such as 4-heptanol, decyl alcohol, 2-phenoxyethanol, nonanol, 3-methyl-2-heptanone, methyl octanoate, 3-methyl-2-heptanol, 1-heptanol, 1-octanol, 2-hexanol, 2-octanol, 2-methyl-2-hexanol, 2-methyl-2-heptanol, 6-methyl-2-heptanol, and 2-heptanol. These additives are supplied to the lithium bromide-water fluid in the



range of 50 to 1,000 parts per million on a weight basis of the lithium bromide-water solution.

3,609,088

METHOD OF PREPARING AGGLOMERATED DETERGENT COMPOSITION

Clark A. Sumner, Downey, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Continuation of application Ser. No. 764,634, Oct. 11, 1968. This application May 21, 1969, Ser. No. 826,481
Int. Cl. C11d 7/56
U.S. Cl. 252—99 5 Claims

A method of producing agglomerates of detergent ingredients by charging particulate detergent ingredients into an agglomeration zone and maintaining a falling curtain of said ingredients in said zone, contacting said particulate material in said falling curtain with liquid material to agglomerate said particulate material, maintaining a tumbling bed of agglomerating ingredients at the base of said falling curtain and withdrawing agglomerated material from said agglomeration zone.

3,609,089

PROCESS FOR CLEANING ROAD VEHICLES AND COMPOSITION

Clifford M. Cantrell, Cincinnati, Ohio; David P. MacDonald, Ludlow, Ky., and Millard J. Laugle, Cincinnati, Ohio, assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 22, 1967, Ser. No. 662,300
Int. Cl. C11d 1/22
U.S. Cl. 252—137 5 Claims

Process for cleaning road film from road vehicles with a dilute aqueous solution of a cleaning composition. The cleaning composition is a mixture of 15–90 parts condensed phosphate, 2–40 parts alkaline builder, 5–60 parts alkali metal chloride, 1–25 parts higher alkylbenzene sulfonate, 1–15 parts of fatty lower alkanolamides, 1–10 parts polyethyoxylated fatty alcohols or alkylphenols, and 1–30 parts of a hydrotropic agent.

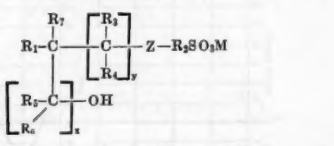
3,609,090

BUILT DETERGENT COMPOSITIONS CONTAINING HYDROXY ETHER SULFONATES

Bjorn Sundby, Highland Park, and Harold Eugene Wixon, New Brunswick, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 29, 1968, Ser. No. 780,172
Int. Cl. C11d 3/065, 1/12
U.S. Cl. 252—138 11 Claims

A detergent composition comprising a compound having the formula



wherein:

(1) R_1 is a straight or branched higher alkyl group of C_6 to C_{30}, and preferably C_{10} to C_{22};

(2) R_2 is a straight or branched alkyl of C_3 to C_{12}, and preferably C_3 to C_6;

(3) R_3 to R_7 are, independently, hydrogen or straight or branched alkyl of C_1 to C_{10}, and preferably hydrogen or lower alkyl of C_1 to C_4;

(4) Z is oxygen (—O—) or sulfur (—S—);

(5) x and y have the values 0 to 1 and $x+y=1$; and

(6) M is a cation such as hydrogen, alkali metal, ammonium, substituted ammonium or amine and preferably a water-solubilizing, salt-forming group. The hydroxy oxa (or thia) sulfonates of the detergent composition provide both detergency and fabric-softening characteristics and are hereinafter referred to generally as hydroxy ether sulfonates.

3,609,091

STABILIZED SOLVENT

Eleanor Harden (nee Boothman), Widnes, England, and Robert Stewart Gow, Stevenston, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of application Ser. No. 459,880, May 28, 1965, which is a continuation of application Ser. No. 852,522, , now abandoned. This application Nov. 20, 1969, Ser. No. 878,541

Int. Cl. C09d *9/00;* **C11d** *7/50;* **C23q** *5/02*

U.S. Cl. 252—171 **20 Claims**

There is provided a composition of 1,1,1-trichloroethane which has as stabilizer therefor an alkyl or alkoxyalkyl ester of nitric acid which contains less than 5 carbon atoms per molecule and mixtures thereof. The stabilizer may be in the amount of 0.5 to 10 percent by weight of the 1,1,1-trichloroethane. Additional stabilizers may be included in the composition, among which are acrylonitrile and butene oxides.

3,609,092

ALKALI METAL PHOSPHATE COMPOSITION AND PROCESS FOR PRODUCING SAME

Keith J. Smith, Lockport, and Harold S. Eldridge, Kenmore, both of N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Dec. 26, 1967, Ser. No. 693,066

Int. Cl. C01b *25/30;* **C02b** *5/04;* **C23f** *14/02*

U.S. Cl. 252—175 **9 Claims**

An incompletely molecularly dehydrated alkali metal polyphosphate composition prepared by heating an alkali metal phosphate mixture having a ratio of alkali metal oxide to P_2O_5 within the range of about 1.15 to 1.40:1 and an Na_2O to K_2O ratio which is not substantially in excess of about 6:1, the heating of the mixture being carried out at a temperature within the range of about 100° C. to 500° C., at atmospheric pressure, for a period sufficient to obtain a product having an ignition loss which is not substantially greater than about 5% by weight of the product. The resulting polyphosphate composition has good water solubility and sequestering action.

3,609,093

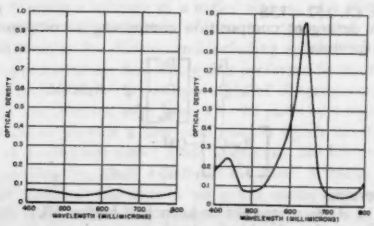
PHOTOCHROMIC RADIATION DOSIMETER

Larry A. Harrah, Albuquerque, N. Mex.

Filed Sept. 11, 1968, Ser. No. 758,959

Int. Cl. G02c *7/10;* **G02b** *5/20*

U.S. Cl. 252—300 **5 Claims**



A photochromic radiation dosimeter comprising a homogeneous mixture of a poly(halostyrene) host and a compound selected from the general structure of triarylmethane carbinols, ethers or azides substituted in one or more of the aryl moieties with hydroxyl or amine auxochromes.

3,609,094

YTTERBIUM-ACTIVATED STRONTIUM PHOSPHATE PHOSPHORS

Francis N. Shaffer, Towanda, Pa., assignor to Sylvania Electric Products Inc.

Filed Oct. 15, 1968, Ser. No. 767,728

Int. Cl. C09k *1/36*

U.S. Cl. 252—301.4 P **1 Claim**

Compounds of the ytterbium-activated strontium phosphate are novel and useful blue-emitting phosphors under cathode-ray and X-ray excitation.

3,609,095

URANIUM DIOXIDE ARTICLE AND METHOD OF PRODUCING THE SAME

Brian S. Wyatt, Deep River, Ontario, Canada, assignor to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Feb. 24, 1969, Ser. No. 801,809

Int. Cl. C09k *3/00*

U.S. Cl. 252—301.1 **7 Claims**

The invention relates to the production of uranium dioxide articles such as nuclear fuel elements and ceramic shapes and which comprise a powdered mixture of UO_{2+x} and U or Pu metal, wherein X is the amount of excess O_2 required to produce, from said mixture, stoichiometric UO_2 when subjected to reaction conditions under irradiation.

One of the problems incidental to the use of nuclear fuel elements containing vibration packed mixtures of uranium dioxide (UO_2) powders is the shrinkage of the UO_2 that occurs at the high temperatures generated in the fuel element during irradiation. The maximum packed densities thus far obtained in nuclear fuel elements, made by vibration packing inside a metal sheath a mixture of different size fractions of UO_2 powders, are in the range of 88–92 percent of the theoretical density. The UO_2 powder is commonly prepared by crushing previously sintered or fused blocks of UO_2. During irradiation of such an element, the UO_2 powder tends to sinter with resultant shrinkage of the UO_2 body . This shrinkage could impair heat transfer between fuel and sheath and might eventually result in the collapse of the fuel-sheathing when this is insufficiently thick to be self-supporting in the reactor coolant pressure.

3,609,096

COMPOSITION FOR EMULSIFYING HYDROCARBONS

Georges Henri Salomone, 14 Avenue Pierre Ier de Serbie, Paris, 16eme, France

Filed Aug. 12, 1968, Ser. No. 751,764

Claims priority, application France, Apr. 3, 1968, 146,840

Int. Cl. B01f *17/00;* **C11d** *3/04, 7/08*

U.S. Cl. 252—352 **3 Claims**

A composition for emulsifying hydrocarbons with fresh water or brackish water or sea water consists essentially of 30 to 70 percent by weight of strong mineral acid, 15 to 35 percent by weight of alkali metal salt or alkaline earth metal salt, and 15 to 35 percent by weight of a hydrophilic organic substance such as molasses or unrefined sugar or pancreatic peptone. It is especially useful for cleaning away petroleum products.

3,609,097

CATALYST REGENERATION

Herbert Koppe, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 5, 1968, Ser. No. 742,945

Claims priority, application Germany, July 6, 1967, M 74655

Int. Cl. B01j *11/04*

U.S. Cl. 252—419 **1 Claim**

A steam injector is used to circulate regenerating gas through a catalyst bed to burn off carbonaceous deposits on the catalyst.

3,609,098

HALOESTER AND CUPROUS SALT POLYMERIZATION CATALYST SYSTEMS

James D. Brown, Bartlesville, Okla., assignor to Phillips Petroleum Company

Division of Ser. No. 610,466, Jan. 20, 1967.
Filed Aug. 21, 1969, Ser. No. 852,107
Int. Cl. C08f 7/02
U.S. Cl. 252—429 R 5 Claims

Compositions of matter prepared by the admixture of an ester of a halogenated carboxylic acid with a cuprous salt.

3,609,099

METHOD OF ACTIVATING IMPREGNATED CATALYST

Grant A. Mickelson, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 761,322, Sept. 20, 1968, now abandoned, and a continuation-in-part of Ser. No. 837,340, June 27, 1969, now abandoned. This application Sept. 8, 1969, Ser. No. 856,143
Int. Cl. B01j 11/82, 11/06
U.S. Cl. 252—435 19 Claims

Composites formed by the impregnation of refractory oxide supports with thermally decomposable salts of catalytically active metals are activated to produce highly active catalysts by heating the composites at a controlled rate to the prescribed calcination temperature while intimately contacting the composites with at least about 1 and preferably at least about 2 s.c.f.m. of injected air per pound of composite having an initial temperature below about 500° F.

3,609,100

BLOCK COPOLYMERS OF POLAR MONOMERS

Theodore F. Niemann, Brecksville, Ohio, assignor to The BF Goodrich Company, New York, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,961
Int. Cl. C08f 15/38
U.S. Cl. 252—431 R 6 Claims

Polar monomers can be polymerized to obtain block copolymers by the sequential addition of the polar monomers. The polymerization is initiated with an organolithium compound in combination with a heterocyclic compound containing a sulfur heteroatom. Acrylonitrile, methacrylonitrile and alkyl acrylates and methacrylates are copolymerized to two- and three-block copolymers with an initiator system consisting of an alkyl lithium compound and five- or six-membered heterocyclic compound or fused heterocyclic ring system derived therefrom, where the heteroatom is sulfur which may be unsubstituted or contain one or two oxygen atoms bonded thereto but external to the ring.

3,609,101

PROCESS AND CATALYST FOR THE BLOCK COPOLYMERIZATION OF POLAR MONOMERS

Theodore F. Niemann, Brecksville, Ohio, assignor to The BF Goodrich Company, New York, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,962
Int. Cl. C08f 15/38
U.S. Cl. 252—431 4 Claims

Polar monomers can be copolymerized to obtain block copolymers by the sequential addition of the polar monomers when the polymerization is initiated with an organolithium compound in combination with a compound containing a sulfinyl or sulfonyl group. Acrylonitrile, methacrylonitrile and alkyl acrylates and methacrylates are copolymerized to two- and three-block copolymers with alkyl lithium-diphenyl sulfone or alkyl lithium-diphenyl sulfoxide initiator systems.

3,609,102

MULTICOLORED TRANSPARENT POLYMER GEL EMOLLIENT BASES, WITH OIL-MISCIBLE DYES, FOR OIL-SOLUBLE COSMETICS, PERFUME AND PHARMACEUTICALS

Mitchell L. Schlossman, Rockaway, N.J., assignor to Paris Cosmetics, Inc.

Filed Oct. 2, 1969, Ser. No. 863,356
Int. Cl. G01n 31/22; A61k 7/00; C11b 9/00
U.S. Cl. 252—522 7 Claims

The composition comprises a first polar phase and a second nonpolar phase. The second phase is comprised of a plurality of discrete macroscopic bodies dispersed throughout the first phase. The first phase comprises a polar solvent having a polymer dissolved therein. The polymer imparts a Bingham yield value to the composition which is sufficient to retain the second phase in dispersion. The bodies impart to the composition an optical effect which can be enhanced by incorporating into said bodies differing colors.

3,609,103

HYDROCARBON CONVERSION CATALYSTS CONTAINING DISPERSED CLAY

Elroy M. Gladrow, and Warren M. Smith, both of Baton Rouge, La., assignors to Esso Research and Engineering Company

Continuation of application Ser. No. 657,055, July 31, 1967, now abandoned. This application Nov. 28, 1969, Ser. No. 876,191
Int. Cl. B01j 11/40
U.S. Cl. 252—455 Z 19 Claims

The attrition resistance of hydrocarbon conversion catalysts comprising a crystalline aluminosilicate zeolite distributed throughout a clay-containing matrix, preferably a matrix comprising a siliceous gel and a clay, is improved by first dispersing the clay to form particles having a prescribed size distribution prior to its combination with the other two components. The improved product and its use in hydrocarbon conversion reactions is described.

3,609,104

ELECTRICALLY CONDUCTIVE GASKET AND MATERIAL THEREOF

John E. Ehrreich, Watertown, and Adrian R. Reti, Cambridge, both of Mass., assignors to Ercon, Inc., Cambridge, Mass.

Filed Feb. 15, 1968, Ser. No. 705,593
Int. Cl. H01b 1/06; C08f 1/84
U.S. Cl. 252—511 30 Claims

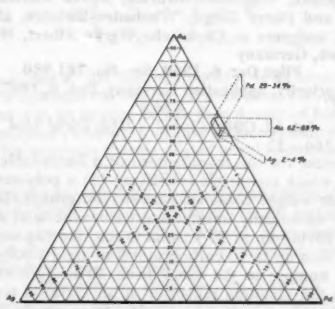
An article loaded with a filler providing good electrical or heat conductivity is formed by mixing the filler with particles of nonflowing compressible resin, as well as a sufficient amount of flowable resin. The flowable resin is then hardened. The nonflowing resin particles concentrate the filler particles in a network of high conductivity pathways and in this way they provide high conductivity in the macrostructure with a very low overall concentration of filler particles; and at the same time they enhance the resilience of the finished article. They also prevent settling of the filler particles prior to hardening, thereby maintaining a fairly homogeneous dispersion of the filler.

3,609,105

METALIZING MATERIAL

Sandford S. Cole, Jr., West Caldwell, N.J., assignor to Alpha Metals Inc., Jersey City, N.J.

Filed June 8, 1970, Ser. No. 44,416
Int. Cl. H01b 1/02; B44d 1/02
U.S. Cl. 252—514 7 Claims



A metallizing composition for forming electrically conductive areas on dielectric materials, which areas bond securely to the dielectric base materials, and which areas form secure bonds with conductive and mechanical attachments, the

composition being a mixture by weight of approximately 63.7 percent gold, 32.3 percent palladium, 4.0 percent silver.

3,609,106

ANTIMONY CARBOXYLATES AND ALCOHOLATES AS CATALYSTS IN PRODUCING POLYESTER-POLYURETHANE POLYMERS

Anthony Joseph Papa, St. Albans, and William Robert Proops, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 4, 1969, Ser. No. 813,751
Int. Cl. C08g *41/00*
U.S. Cl. 260—2.5 AB **6 Claims**

The production of polyester-polyurethane products is improved by the use of antimony carboxylates and antimony alcoholates, such as antimony triisopropoxide and antimony octoate, as catalysts. The products have improved thermal properties and can be used in those applications wherein urethane foams are conventionally employed and improved thermal properties are desired.

3,609,107

SELF-EXTINGUISHING POLYURETHANE FOAMS

Nicodemus E. Boyer, Parkersburg, W. Va., and Marvin P. Weaver, Belpre, Ohio, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 23, 1969, Ser. No. 827,160
Int. Cl. C08g *51/50, 22/44, 51/30*
U.S. Cl. 260—2.5 AJ **7 Claims**

A polyurethane foam composition containing dialkyl hydroxyalkanephosphonates incorporated therein. The phosphonate compounds are utilized as integral parts of the polyurethane polymeric chain and are chemically combined therewith to lend fire-retardant characteristics to the polyurethane composition.

3,609,108

RUBBER MODIFIED WITH TRIS-SUBSTITUTED RESORCINOL COMPOUNDS

Alfred J. Kolka; Wun T. Tai, and Roy H. Moult, all of 440 College Park Drive, Monroeville, Pa.

Division of Ser. No. 565,380, July 15, 1966, abandoned.
Filed Jan. 31, 1969, Ser. No. 813,353
Int. Cl. C08c *9/00*
U.S. Cl. 260—3 **2 Claims**

Novel rubber compositions having increased adhesion to fabrics and lower modulus value and the method of their preparation are disclosed. The addition of certain tris-substituted resorcinol compounds to rubber containing resorcinol, a resorcinol resin or other polymerizable reinforcing additive provides the above-described properties.

3,609,109

HARDENABLE POLYESTER POLYCONDENSATES

Klaus Plesske, Wiesbaden-Biebrich; Alfred Kuhlkamp, Hofheim, and Dieter Zingel, Wiesbaden-Biebrich, all of Germany, assignors to Chemische Werke Albert, Wiesbaden-Biebrich, Germany

Filed Dec. 6, 1968, Ser. No. 781,980
Claims priority, application Germany, Dec. 8, 1967, P 17 20 424.9
Int. Cl. C08g *17/007, 17/10;* C09d *3/64*
U.S. Cl. 260—22 **11 Claims**

A process for the manufacture of a hardenable polycondensate which comprises esterifying (a) a polymer of a low molecular weight containing carboxylic groups, (b) a saturated or olefinically unsaturated carboxylic acid or mixture thereof having up to 25 carbon atoms and (c) a polyhydric alcohol with up to 10 carbon atoms to yield a polyester with an acid number in the range from 30 to 120, and further reacting the resulting polyester at an elevated temperature with a mono-epoxide compound having up to 20 carbon atoms, a hardenable polycondensate consisting essentially of a polyester having an acid number in the range from 30 to 120 and derived from the components (a) to (c), a mixture thereof with a reactive resin and a hardened product thereof.

3,609,110

COMPOSITION FOR ELECTROPHORETIC DEPOSITION

Ju Kumanotani, Chofu-shi, Tokyo-to, Japan, assignor to Kansai Paint Company Limited, Kanzaki, Amagasaki-shi, Hyogo-ken, Japan

Filed Nov. 6, 1967, Ser. No. 680,973
Claims priority, application Japan, Nov. 7, 1966, 41/73164
Int. Cl. C09d *3/00*
U.S. Cl. 260—29.7 **12 Claims**

In a coating composition adapted for electrophoretic deposition containing an aqueous medium and a resinous binder dispersed therein, the improvement comprising the resinous binder being a modified polybutadiene glycol prepared by reacting a polybutadiene glycol having hydroxyl group at both ends of the polymer main chain and a number average molecular weight of 200 to 10,000 with acid anhydride to produce a half ester of the polybutadiene glycol and neutralizing the resultant half ester with a base to turn it water dispersible.

3,609,111

COMPOSITION FOR ELECTROPHORETIC DEPOSITION

Ju Kumanotani, Chofu-shi, Japan, assignor to Kansai Paint Company Limited, Kanzaki, Amagasaki-shi, Hyogo-ken, Japan

Filed Nov. 6, 1967, Ser. No. 680,988
Claims priority, application Japan, Nov. 7, 1966, 41/73163
Int. Cl. C09d *3/00*
U.S. Cl. 260—29.7 **10 Claims**

In a coating composition adapted for electrophoretic deposition containing an aqueous medium and a resinous binder dispersed therein, improvement comprising the resinous binder being a modified butadiene polymer prepared by reacting a butadiene polymer of a number average molecular weight of 200 to 5,000 with an α,β-ethylenically unsaturated monocarboxylic acid and neutralizing the resultant adduct with a base to turn it water-dispersible.

3,609,112

UREA-URETHANE COMPOSITIONS FROM 1-AMINO-3-AMINOMETHYL-3,5,5-TRIMETHYL CYCLOHEXANE

Herbert M. Schroeder, and Paul C. Stievater, both of Williamsville, N.Y., assignors to Tertron Inc.

Filed June 30, 1967, Ser. No. 656,615
Int. Cl. C08g *22/00*
U.S. Cl. 260—30.2 **34 Claims**

A urea-urethane composition is prepared by reaction of 1-amino-3-aminomethyl-3,5,5-trimethyl cyclohexane with urethane prepolymer.

3,609,113

POLY-(ARYLENE-TRIKETOIMIDAZOLIDINES) AND PROCESS FOR PREPARING THE SAME

Gerhard Schade, Witten-Bommern, and Franz Blaschke, Witten-Ruhr, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Witten-Ruhr, Germany

Filed Apr. 4, 1969, Ser. No. 813,761
Claims priority, application Germany, Apr. 6, 1968, P 17 70 146.1
Int. Cl. C08g *22/08, 51/34, 51/44*
U.S. Cl. 260—30.2 **19 Claims**

Poly-(arylene-triketoimidazolidines) are prepared by reacting approximately diamine amounts of bis- (oxalic acid-monoalkyl ester-monoamide) of an aromatic diamine with an aromatic diisocyanate in a polar organic solvent at an elevated temperature. The polymers melt at about 310° C. up to > 400° C. with decomposition. Organic solvent solutions thereof can be used for the production of high-temperature resistant films and fibers as well as coatings for metals. Wire insulating varnishes can also be prepared therefrom.

3,609,114

MOLDABLE INTERPOLYMERS, CAST PRODUCTS THEREOF AND APPARATUS FOR THE PROCESSING THEREOF

Elvin M. Bright, Sr., 15940 Valley Vista Blvd., Encino, Calif.

Filed Nov. 28, 1967, Ser. No. 686,170
Int. Cl. C08g 51/26
U.S. Cl. 260—30.4 EP 10 Claims

A transparent and/or internally colorable, thermosetting, molded article curable at room temperature and having the capability to embed up to 90 percent of high density particles suspended by micronized silica or, alternately, contain internally visible objects, providing an article of manufacture including both structural and art objects. Typically, the article is polymerized from a clear fluid mixture of bisphenol-A-type epoxy resin and alkyl acrylate monomer dissolved in glycidyl esters of low viscosity, plus a viscosity-lowering catalyst such as N-aminoethyl piperazine; the resulting interpolymer is characterized by workability of 150 percent to 300 percent elongation without stress when 75 percent polymerized. The polymer characteristically does not recede from mold face in casting and hence may be formed with fine engravinglike surface configurations. Wafer-thin castings of flexible, incompletely cured polymer may be permanently bonded to rigid surfaces by coating with silicone resin adhesive and silicone polymerization catalyst. Also provided are unique apparatus and a process for molding wafers, plaques and the like of the invention composition and for laminating the same permanently to another body while completing polymerization of the composition in intimate contact with an adhesive also undergoing polymerization.

3,609,115

PROPELLANT BINDER

George D. Sammons, and Liles G. Herring, both of Waco, Tex., assignors to North American Rockwell Corporation

Filed Sept. 30, 1963, Ser. No. 312,782
Int. Cl. C08f 45/44; C08g 51/44
U.S. Cl. 260—32.4 12 Claims

This invention relates to solid propellant formulations. More particularly, it relates to a novel binder for utilization in such solid propellants.

3,609,116

MOLDABLE SHIM MATERIAL FOR DIMENSIONAL AND AERODYNAMIC SURFACE CONTROL OF AEROSPACE STRUCTURE

Jack E. Thomas; Harold P. Owen; Wallace S. Hay, and Jack W. McNeilly, all of Fort Worth, Tex., assignors to General Dynamics Corporation

Filed Dec. 6, 1968, Ser. No. 781,913
Int. Cl. C08g 51/04
U.S. Cl. 260—37 EP 3 Claims

A moldable shim material comprised of specific epoxide resins, buna-N-rubber, filler materials and curing catalysts, which when mixed together in the specified proportions provide superior strength, adhesion and thermal resistance qualities; characteristics which are particularly desirable for structures utilized in aerospace applications.

3,609,117

POLYESTER RESINS AND PROCESSES FOR PREPARING SAME

William H. Deis, Belmont; Wesley Werner Ness, San Bruno, and Gerald Bohm, Sacramento, all of Calif., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of application Ser. No. 587,658, Oct. 19, 1966, now abandoned. This application Feb. 6, 1970, Ser. No. 9,092
Int. Cl. C08k 1/06
U.S. Cl. 260—40 R 4 Claims

Magnesia having an iodine number greater than 100, a particle size of 0.4–3 microns, and containing about 86–96 weight percent of MgO for use as a chemical thickening agent in polyester resin systems.

3,609,118

POLYESTERS STABILIZED WITH A PHOSPHONITE

Eberhard Pilz, Bobingen; Klaus Hoheisel, Wiesbaden-Biebrich, and Eberhard Werner, Wiesbaden-Biebrich, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Dec. 2, 1968, Ser. No. 780,559
Claims priority, application Germany, Dec. 4, 1967, P 16 94 549.6
Int. Cl. C08g 51/58
U.S. Cl. 260—45.7 2 Claims

This invention relates to a thermostabilized linear polyester or copolyester containing 0.001 to 5 percent by weight, based on the weight of the diester component, of phenyl diphenoxy phosphine as a thermostabilizer.

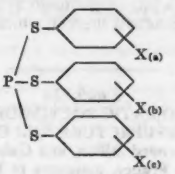
3,609,119

POLYESTERS STABILIZED WITH THIOPHOSPHITES

Eberhard Pilz, Bobingen uber Augsburg; Klaus Hoheisel, Wiesbaden-Biebrich, and Eberhard Werner, Wiesbaden-Biebrich, all of Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany

Filed Dec. 2, 1968, Ser. No. 780,572
Claims priority, application Germany, Dec. 4, 1967, P 16 94 548.5
Int. Cl. C08g 51/58
U.S. Cl. 260—45.7 8 Claims

This invention relates to a thermostabilized linear polyester or copolyester containing 0.001 to 5 percent by weight, calculated on the weight of the diester component employed, of a stabilizer having the formula



wherein

a, *b*, and *c* are integers between 1 and 5, preferably 1 to 3,

X is a straight-chain or branched-chain or cyclic saturated hydrocarbon group having not in excess of 10, preferably one to four, carbon atoms, particularly methyl or tert. -butyl groups, or an aromatic group, particularly a phenyl group.

3,609,120

NOVEL CHEMICAL COMPOUNDS AND STABILIZED HALOGEN-CONTAINING RESINS

Peter Albert Theodore Hoye, Stourbridge, and Donald Albert Wood, Quinton, Birmingham, both of England, assignors to Albright & Wilson, Limited, Oldbury near Birmingham, England

Filed Feb. 24, 1969, Ser. No. 801,825
Int. Cl. C08f 45/62
U.S. Cl. 260—45.75 8 Claims

This invention is one of novel compounds of the formula

wherein R and R′ are hydrocarbons, X is an organic radical such as a hydrocarbon bonded to a tin atom through a sulfur atom and *n* is an integer of less than 4, and of halogen-containing polymers stabilized against the deteriorative effects of heat by the presence therein of said novel compounds.

3,609,121

CURABLE EPOXY RESIN COMPOSITIONS CONTAINING NOVEL DISECONDARY DIAMINES

Friedrich Lohse, Allschwil; Rolf Schmid, Muenchenstein, and Hans Batzer, Arlesheim, all of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed July 30, 1968, Ser. No. 748,590
Claims priority, application Switzerland, Aug. 9, 1967, 11217/67
Int. Cl. C08g 30/14
U.S. Cl. 260—47 11 Claims

Curable epoxy resin mixtures suitable for use as casting, impregnating or laminating resins or binders, coacting or

sealing compositions, characterized in that they contain 1. a diepoxy compound containing two 1,2-epoxyethyl residues, (II) a disecondary diamine of the formula

$$R_1-NH-CH_2-CH_2-CH_2-O-[R_3-O]_{n-1}CH_2-CH_2-CH_2-NH-R_2$$

in an amount of 0.3 to 0.9, preferably 0.5 to 0.8 equivalent of active hydrogen atoms linked with nitrogen for every equivalent of epoxide groups of the diepoxy compound (I), in which formula R_1 and R_2 each represents a saturated carbocycle or cyclic system which may be unsubstituted or substituted by alkyl groups, containing at least five cyclic carbon atoms; R_3 represents the residue of a glycol or polyglycol from which the terminal hydroxyl groups have been removed, and n=1 or 2, and (III) a polyamine containing at least three active hydrogen atoms linked with nitrogen in an amount of 0.2 to 0.8, preferably 0.4 to 0.6 equivalent of active hydrogen atoms linked with nitrogen for every epoxide equivalent of the diepoxy compound (I).

3,609,122

NITRO-SUBSTITUTED HYDROXY-BENZENE GLYCIDYL ETHERS AND CURED PRODUCTS THEREOF

Gerald J. Fleming, Bowie, Md.

Filed Jan. 31, 1969, Ser. No. 795,745
Int. Cl. C08g *30/04*
U.S. Cl. 260—47 EP **9 Claims**

Glycidyl ethers derived from the reaction of an epihalohydrin and a nitro-substituted hydroxy-benzene compound and cured products thereof, which are useful as ablative materials.

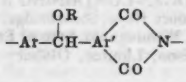
3,609,123

NEW AROMATIC POLYIMIDES, THEIR MANUFACTURE AND USES

Guy Rabilloud; Bernard Sillion, and Gabriel De Gaudemaris, all of Grenoble, France, assignors to Institut Francais Du Petrole Des Carburants Et Lubrifiants, Rueil Malmaison (Hauts de Seine), France

Filed Mar. 10, 1969, Ser. No. 805,857
Claims priority, application France, Mar. 21, 1968, 144,875
Int. Cl. C08g *20/32*
U.S. Cl. 260—47 CP **30 Claims**

Having a variety of uses, including the production of varnishes, films, fibers, adhesives, and cross-linked structures, there are provided polymers of



in which Ar is a divalent aromatic radical, the two valences of which are connected to distinct carbon atoms, Ar' is a trivalent aromatic radical, the three valences of which are connected to distinct carbon atoms, the two valences connected to the CO groups being in ortho position with respect to one another, and R is selected from the group consisting of a hydrogen atom, alkyl, alkylcarbonyl, aryl, arylcarbonyl, alkyliminocarbonyl, aryliminocarbonyl and trimethylsilyl.

3,609,124

PROCESS FOR STABILIZING POLYOXYMETHYLENES

Jacob Ackermann; Franco Ferre, and Giorgio Anessi, all of Milan, Italy, assignors to Societa Italiana Resine S.p.A., Milan, Italy

Filed July 25, 1968, Ser. No. 747,430
Claims priority, application Italy, Aug. 1, 1967, 19065-A/67
Int. Cl. C08g *1/24*
U.S. Cl. 260—67 FP **10 Claims**

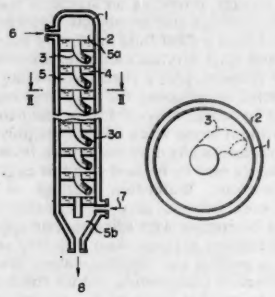
During the stabilization of a polyoxymethylene by means of a carboxylic acid anhydride in a liquid reaction medium, the concentration of monomeric formaldehyde in the vapor phase in equilibrium with the liquid phase is maintained at a value of from 1 to 50 percent (preferably 1–20 percent) by weight, whereby degradation of the polyoxymethylene is substantially reduced.

3,609,125

POLYESTERIFICATION PROCESS AND APPARATUS

Yoshihisa Fujimoto; Yoshio Kimura; Iwao Terasaki, and Takanobu Kitago, all of Nobeoka-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 21, 1969, Ser. No. 817,938
Claims priority, application Japan, Apr. 24, 1968, 43/27090
Int. Cl. C08g *17/01*
U.S. Cl. 260—75 **3 Claims**



A process for producing polymers of medium degree of polymerization from polymerizable liquid, which comprises continuously passing the polymerizable liquid and vaporous byproducts through a vertical series of reaction zones, each maintained at a temperature to promote polymerization, successively from the uppermost reaction zone to the lowermost reaction zone by pressure difference between the vaporous byproducts in the adjacent reaction zones and gravity of the liquid, and causing said liquid and vaporous byproducts to flow as a stream from the upper reaction zone onto the liquid surface in the lower reaction zone, said stream being so directed as to produce rotating current in the liquid in said lower reaction zone, whereby agitation of said liquid is produced; and an apparatus for carrying out the above process, comprising a reaction vessel including a vertical series of reaction chambers each having bottom and sidewalls, an inlet connected to the uppermost chamber to supply the polymerizable liquid into the vessel, an outlet connected to the lowermost chamber to discharge polymerized liquid and vaporous byproducts from the vessel, and connecting tubes each connecting one of the chambers with the one located immediately therebelow, each of said connecting tubes having its upper end situated above the bottom wall of the upper chamber so as to define depth of the liquid contained therein and its lower end situated above the surface of the liquid contained in the lower chamber and so directed as to produce rotating current in the liquid.

3,609,126

PROCESS FOR PRODUCING WATER-SOLUBLE THERMOSETTING POLYMER

Hiroshi Asao, Yokohama; Fujio Yoshida, Yokohama; Kenichi Tomihara, Tokyo; Mikio Akimoto, Yokohama, and George Kubota, Tokyo, all of Japan, assignors to Toho Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 6, 1968, Ser. No. 710,734
Claims priority, application Japan, Mar. 8, 1967, 42/14208
Int. Cl. C08g *20/38*
U.S. Cl. 260—78 **7 Claims**

A process for producing a water-soluble thermosetting polymer by reacting a dibasic carboxylic acid with a polyalkylene polyamine, then an alkylene oxide and then an epihalohydrin in successive steps.

3,609,127

PREPARATION OF POLYMERISABLE POLYCARBONAMIDE COMPOSITION

Vincent Matthews, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 22, 1968, Ser. No. 731,317
Claims priority, application Great Britain, May 25, 1967, 24420/67
Int. Cl. C08g *20/38*
U.S. Cl. 260—78 SC 9 Claims

A process for the manufacture of a polymerisable composition comprising water, a low molecular weight polyamide derived from a first diamine having from 2 to 12 carbon atoms and a first dicarboxylic acid having from 6 to 12 carbon atoms, and the salt of a second said diamine with a second said dicarboxylic acid, which process comprises heating a high molecular weight polyamide derived from the first said diamine and the first said dicarboxylic acid with an aqueous solution of the second said dicarboxylic acid and neutralizing the resulting solution with the second said diamine.

3,609,128

METHOD OF PRODUCING NITRILE POLYMERS

Iral B. Johns, Marblehead, Mass., assignor to Monsanto Research Corporation, Saint Louis, Mo.

Filed Oct. 24, 1969, Ser. No. 871,343
Int. Cl. C08f *1/72, 1/76, 3/74*
U.S. Cl. 260—78.4 N 5 Claims

Method for producing polymers of nitriles, especially perfluoroglutaronitrile and acetonitrile, in the presence of catalytic materials such as, graphite, nickel chloride, metal cyanocoordination compounds, e.g., copper phthalocyanine, at elevated temperatures, and in some cases, elevated pressures.

3,609,129

METHOD OF POLYMERIZING ACRYLONITRILE IN THE PRESENCE OF AN ALKALI METAL ALCOHOLATE OF AN α-HYDROXYALKYLAMINE

Valentina Nikolaevna Krasulina, prospekt Morisa Toreza, 102, korp. 5, kv. 267, Leningrad; Anna Valentinovna Novoselova, Tramvainy prospekt, 32, kv. 5, Leningrad; Alexei Andreevich Korotkov, deceased, late of Leningrad; Maria Julievna Lekakh, administratrix, Naberezhnaya Chernoi rechki, 10, kv. 7, Leningrad (of said Alexei Andreevich Korotkov, deceased), and Sergei Alexeevich Korotkov, administrator, Naberezhnaya Chernoi rechki, 10, kv. 7, Leningrad, U.S.S.R. (of said Alexei Andreevich Korotkov, deceased)

Filed June 14, 1968, Ser. No. 738,730
Int. Cl. C08f *3/76, 15/22*
U.S. Cl. 260—85.5 6 Claims

Polyacrylonitrile is produced by polymerizing acrylonitrile in the presence of a novel catalyst at a temperature of −80° C. to 40° C. The catalyst is an alkali metal alcoholate of an α-hydroxyalkylamine.

3,609,130

POLYMER AND PROCESS OF MAKING SAME

John A. Manson, Bethlehem, Pa., and George L. Moore, South Plainfield, N.J., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of application Ser. No. 671,145, Sept. 27, 1967, now abandoned. This application Apr. 23, 1970, Ser. No. 29,730
Int. Cl. C08f *1/13, 17/00, 27/16*
U.S. Cl. 260—87.3 7 Claims

A copolymer of vinyl acetate and bicycloheptadiene, which can be converted by hydrolysis to a vinyl alcohol copolymer, is produced by polymerizing vinyl acetate and bicycloheptadiene in the presence of a radical initiator.

3,609,131

COPOLYMERS OF VINYL CHLORIDE AND OLEFINS AND PROCESSES FOR THEIR PREPARATION

Philippe Lalet, Orthez; Guy Tsouladze, Pau, and Henri Fassy, Orthez, all of France, assignors to Societe Anonyme dite: Societe Nationale Des Petroles D'Aquitaine, Courbevoie, France

Filed Dec. 23, 1968, Ser. No. 786,388
Claims priority, application France, Dec. 29, 1967, 134,501
Int. Cl. C08f *3/30;* C09f *3/00*
U.S. Cl. 260—87.5 C 6 Claims

Vinyl resins are prepared by copolymerizing vinyl chloride in the presence of at least one branched olefin having at least seven carbon atoms. The use of C_7, C_9, C_{12} and C_{15} olefinic isomers is specifically described. The process is preferably performed in aqueous suspension between 30° C. and 80° C. and at a pressure less than 20 atmospheres.

The new copolymers have good properties of shock resistance, working and solubility and are of application in fields where vinyl chloride resins are used.

3,609,132

WATER-SOLUBLE COPOLYMER AND ITS USE AS A PIGMENT RETENTION AID

Andrew G. Tsuk, and Charles C. Kirk, both of Laurel, Md., assignors to W. R. Grace & Co.

Filed Jan. 26, 1970, Ser. No. 5,965
Int. Cl. C08f *15/02, 27/16*
U.S. Cl. 260—85.7 2 Claims

This invention relates to a novel cationic water-soluble polyvinyl alcohol prepared from a water-soluble vinyl acetate/N-vinyl-N-methyl acetamide copolymer by hydrolysis. The hydrolyzed copolymer significantly enhances the retention of pigment particles by the cellulose fibers in a paper pulp slurry.

3,609,133

METHOD OF PRODUCING VINYL HALIDE POLYMERS IN THE PRESENCE OF HYDROXYL-OR MERCAPTO-ALKYLSULFOXIDE EMULSIFIERS

Anthony J. Castro, Oak Park, and Eugene J. Miller, Jr., Wheaton, both of Ill., assignors to Armour Industrial Chemical Company, Chicago, Ill.

Filed Feb. 12, 1969, Ser. No. 798,811
Int. Cl. C08f *3/22, 3/30, 15/08*
U.S. Cl. 260—92.1 13 Claims

An improved process for producing dispersion grade vinyl halide polymers of small particle size through the use of sulfoxide polymerization emulsifiers thereby obviating the necessity for separation of the polymer from water by precipitation or by use of solvents.

3,609,134

AZO PIGMENTS CONTAINING A 4-CARBOXAMIDO PHENOMORPHOLENE-(3) GROUP

Rudolf Mory, Dornach, Switzerland, assignor to Ciba-Geigy A.G., Basle, Switzerland

Filed Sept. 24, 1968, Ser. No. 762,163
Claims priority, application Switzerland, Oct. 10, 1967, July 25, 1968, 14143/67;11205/68
Int. Cl. C09b *29/36, 35/18;* D06p *1/04*
U.S. Cl. 260—152 14 Claims

Compounds of the formula

$$R_1—N=N—R_2—CONH—R_3$$

in which R_1 and R_3 each represents an aryl or a heterocyclic residue, at least one of the residues R_1 and R_3 being a phenomorpholone-(3) residue, and R_2 represents a hydroxynaphthalene residue in which the azo, hydroxy and carboxylic acid amide groups are in 1,2,3-position or the residue of an enolizable or enolized ketomethylene compound are valuable pigments which are useful for coloring plastics and lacquers in fast yellow-to-red shades of excellent fastness properties.

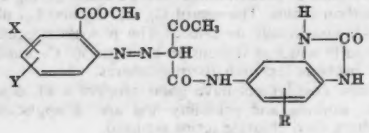
3,609,135

WATER-INSOLUBLE BENZIMIDAZOLONE CONTAINING MONOAZO DYESTUFFS

Joachim Ribka, Offenbach am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft Vormals Meister Lucius, Bruening, Frankfurt am Main, Germany

Filed Nov. 7, 1969, Ser. No. 874,992
Claims priority, application Germany, Nov. 9, 1968, P 18 08 015.4
Int. Cl. C09b *29/32*
U.S. Cl. 260—152 **10 Claims**

Water-insoluble dyestuffs of the general formula



wherein X represents a hydrogen or halogen atom, a methyl, trifluoromethyl, methoxy or nitro group, Y a hydrogen or halogen atom and R a hydrogen or halogen atom, a methyl or methoxy group.

Said pigments can be used, for instance, for dyeing or printing plastics, caoutchouc, natural and synthetic resins, textile fibrous materials or paper. Furthermore, they can be employed for the preparation of printing inks, lacquers and dispersion paints. The novel pigments possess good to very good fastness properties.

3,609,136

WATER-SOLUBLE DYE SALTS OF AZO-PYRIMIDINE DYESTUFFS

Hans Wegmuller, Riehen; Jacques Voltz, Riehen, and Gunter Kaupp, Binningen, Baselland, all of Switzerland, assignors to J. R. Geigy A. G., Basel, Switzerland

Filed May 20, 1968, Ser. No. 730,607
Claims priority, application Switzerland, May 24, 1967, 7388/67
Int. Cl. C09b *29/36, 62/24*; D06p *1/38*
U.S. Cl. 260—154 **11 Claims**

Water-soluble dye salts of cationic 5-arylazo pyrimidine dyestuffs wherein one of the carbon atoms in 2-, 4- and 6-positions of the pyrimidine nucleus is substituted by an aliphatic, cycloaliphatic or carbocyclic aromatic radical bound by way of an —0— or —S—bridge to the pyrimidine nucleus and the remaining carbon atoms in the aforesaid positions are substituted by aliphatically, cycloaliphatically or carbocyclicaromatically monosubstituted amino groups and which dyestuffs contain one external quaternary ammonium group; such dyestuffs being useful for dyeing and printing of synthetic acid-modified polymeric materials, and particularly for the dyeing of blended fabrics consisting of unmodified and acid-modified synthetic polyamide fibers, because they dye the latter with good fastness to light and also to wet treatments, and at the same time reserve well the unmodified polyamide fibers in the blended fabric.

3,609,137

PROCESS FOR THE PRODUCTION OF AN AESCIN-RICH CONCENTRATE OF ACTIVE MATERIAL FROM HORSE-CHESTNUT SEEDS

Hans Georg Menssen, Geyen, Manstedtener, and Hans Honerlagen, Frankfurt-Praunheim, both of Germany, assignors to A. Nattermann & Cie GmbH, Braunsfeld, Germany

Filed May 23, 1969, Ser. No. 827,141
Claims priority, application Austria, May 31, 1968, A 5230/68
Int. Cl. C07c *173/00*
U.S. Cl. 260—210.5 **2 Claims**

An aescin-rich concentrate is obtained from horse chestnuts by comminutating the horse chestnuts, then extracting with acidified water for 1 to 2 hours and discarding the first extract, then again extracting the pretreated horse chestnuts using a low molecular weight alcohol, ketone or aqueous alcohol ketone, and finally drying the second extract.

ERRATUM

For Class 260—215 see:
Patent No. 3,609,377

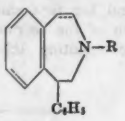
3,609,138

1-ARYL-3-BENZAZEPINES

Robert Paul Mull, Florham Park, and George De Stevens, Summit, both of N.J., assignors to Ciba Corporation, Summit, N.J.

Continuation-in-part of application Ser. No. 523,969, Feb. 1, 1966, now abandoned. This application Dec. 22, 1967, Ser. No. 692,640
Int. Cl. C07d *41/08*
U.S. Cl. 260—239 **3 Claims**

3-Aliphatically substituted 1-aryl-1,2-dihydro- or 1,2,4,5-tetrahydro-3-benzazepines, e.g. those of the formula



R=aliphatic or araliphatic radical

N-oxides, quaternaries and salts thereof are central nervous system depressants.

3,609,139

SUBSTITUTED DIBENZDIAZONINES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Filed Apr. 1, 1969, Ser. No. 812,304
Int. Cl. A61k *27/00*; C07d *57/12*
U.S. Cl. 260—239 DD **6 Claims**

Dibenzdiazonines, e.g., 5-phenyl-7H-dibenz[b,g] [1,5] diazonine, have been prepared which are useful as CNS stimulants.

3,609,140

1-CARBOBENZOXY-1,4-DIAZACYCLOHEPTYL-5-IMINO ACETIC ACID DERIVATIVES

Rudolf G. Griot, Florham Park, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Division of Ser. No. 356,641, Apr. 1, 1964, Pat. No. 3,351,629. Filed Sept. 12, 1967, Ser. No. 698,074
Int. Cl. C07d *53/02, 57/00*
U.S. Cl. 260—239 BC **2 Claims**

The Compounds are of the class of 1,4,8--triazabicyclo-[5,3,0]decen$\Delta^{7,8}$-10-ones, useful as CNS represents and sedatives.

3,609,141

MAGNESIUM SLAT OF 5-METHYL-3-(2,6-DICHLOROPHENYL)-4-ISOXAZOLYL-PENICILLIN

Hiroshi Fujisawa, 2-1, Karikuchidai Tarumi-ku, Kobe, Hogo; Keiichi Sugimoto, 2-2, Tsukumodai, Suita, Osaka; Katsuo Aoki, 3-1-6; Minamikoshien Nishinmiga, Hyogo; Tai Matsuzawa, 5-18, Tsukumodia, Suita, Osaka; Seizo Kawaziri, 441 Kawazono-cho, Suita, Osaka; Hiroyuki Mima, 64 Kizuyama-cho, Hyogo, and Nobuyuki Kitamori, 5-18, Tsukumodai, Suita, Osaka, all of Japan

Filed Feb. 17, 1969, Ser. No. 799,607
Claims priority, application Japan, Feb. 19, 1968, Feb. 7, 1969, 43/10454;44/9600
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 **1 Claim**

Magnesium salt of 5-methyl-3-(2,6-dichlorophenyl)-4-isoxazolyl-penicillin demonstrates antimicrobial activity.

3,609,142

BECKMANN REARRANGEMENT OF CYCLIC KETOXIMES TO LACTAMS

John R. Norell, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Oct. 14, 1966, Ser. No. 586,659
Int. Cl. C07d *41/06*
U.S. Cl. 260—239.3 **10 Claims**

Amides are produced from ketoximes by Beckmann rearrangement in hydrogen fluoride medium at temperature between 0° to 75° C. using a carboxylic acid or anhydride catalyst.

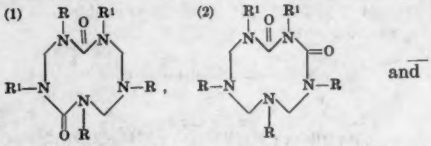
3,609,143

ISOCYANATE ADDUCTS AND PREPARATION THEREOF

John P. Chupp, Kirkwood, Mo., assignor to Monsanto Company, Saint Louis, Mo.

Filed Mar. 16, 1967, Ser. No. 623,541
Int. Cl. A01n 9/22; C07d 55/64
U.S. Cl. 260—239.3 11 Claims

Phytotoxic and soil sterilant compounds of the formula $(CH_2{=}N-R)_2(R^1NCO)_2$ and having either of the following structures:



and

(3) mixtures of (1) and (2),

wherein R is alkyl having a maximum of 4 carbon atoms and R^1 is selected from the group consisting of mono- and dihalosubstituted phenyl and mononitrosubstituted phenyl.

3,609,144

1,4,6-OXADIAZOCINES

Richard W. Hein, Ridgefield, Conn., assignor to Escambia Chemical Corporation, Pace, Fla.

Filed June 20, 1968, Ser. No. 738,400
Int. Cl. C07d 87/54
U.S. Cl. 260—239.3 8 Claims

Production of the novel compounds 4H,6H-3,3,8,8-tetramethyl-2,5,7 trioxo-1,4,6-oxadiazocine, halogen derivatives thereof, and 4H,6H-3,3,8,8-tetramethyl-2,7-dioxo-5-thio-1,4,6-oxadiazocine. The compounds 4H,6H-3,3,8,8-tetramethyl-2,5,7, trioxo-1,4,6-oxadiazocine and 4H,6H-3,3,8,8-tetramethyl-2,7-dioxo-5-thio-1,4,6-oxadiazocine are both useful as crease resistant agents for cloth and are believed to have worthwhile sedative and hypnotic properties whereas the N,N-dihalo derivatives of 4H,6H-3,3,8,8-tetramethyl-2,5,7 trioxo-1,4,6-oxadiazocine are useful as bactericides.

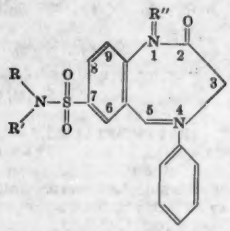
3,609,145

1H-1,4-BENZODIAZEPINE-1-SULFONAMIDES

Robert B. Moffett, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 10, 1969, Ser. No. 790,441
Int. Cl. C07d 53/06
U.S. Cl. 260—239.3 D 3 Claims

Novel 1H-1,4-benzodiazepine sulfonamides of the formula:



VI

wherein R, R′ and R″ are selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, inclusive, are prepared from p-nitrobenzenesulfonamide and its N-alkylated derivatives by (1) condensation with phenylacetonitrile, (2) catalytic hydrogenation, and (3) condensation with ethyl glycinate hydrochloride. The novel products of above formula VI having central nervous depressant and antibacterial activity are useful to tranquilize mammals, e.g., animals during shipping, and are administered in oral or injectable forms.

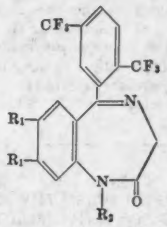
3,609,146

SUBSTITUTED BENZODIAZEPINONE DERIVATIVES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

Filed Nov. 1, 1968, Ser. No. 772,825
Int. Cl. C07d 53/06
U.S. Cl. 260—239.3 D 5 Claims

The invention concerns benzodiazepinone derivatives of the formula



wherein R_1 is hydrogen, methyl, or halogen of atomic weight about 19 to 36, and R_2 is hydrogen, lower alkyl, or dialkylaminoalkyl, and to processes for their production.

The compounds are useful tranquilizers as indicated by their pharmacological activity in animals.

3,609,147

3-HETEROCYCLIC IMIDO-5-SUBSTITUTED-2,4,6-TRIIODO BENZOIC ACIDS AND DERIVATIVES THEREOF

James H. Ackerman, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 715,558, Mar. 25, 1968, now abandoned. This application Mar. 19, 1969, Ser. No. 808,653
Int. Cl. C07d 93/10
U.S. Cl. 260—243 5 Claims

3-Amino-2,4,6-triiodobenzoic acids optionally substituted in the 5-position by amino or carboxy or a derivative thereof react with dibasic acid anhydrides to give the corresponding cyclic imides (A), which can be hydrolyzed to the corresponding anilic acids (B). The latter can be further alkylated on the anilide nitrogen atom. Compounds A and B are useful as cholecystographic and urographic agents.

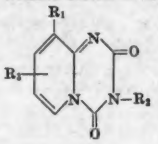
3,609,148

HERBICIDAL PYRIDO[1,2-A]-S-TRIAZINE-DIONES

Karl Hoegerle, Basle; Christian Vogel, Binningen near Basle, and Jurg Rumpf, Binningen near Basle, all of Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Filed Apr. 22, 1969, Ser. No. 818,432
Claims priority, application Switzerland, May 6, 1968, 6700
Int. Cl. C07d 57/04
U.S. Cl. 260—248 6 Claims

Pyrido[1,2-a]-s-triazine-diones of the formula



wherein

R_1 represents hydrogen, halogen, nitro, lower alkyl, lower alkoxy, or halogenalkyl,

R_2 represents straight- or branched-chain alkyl, lower alkenyl, lower alkynyl, cycloalkyl, alkoxyalkyl or halogenalkyl, and

R_3 represents hydrogen, halogen, nitro, lower alkyl, lower alkoxy or halogenalkyl,

are disclosed as herbicidally active compounds. A method of controlling undesirable plant growth with the aid of such compounds and compositions containing them are also described.

3,609,149

METHOD FOR PRODUCING ORGANIC ISOCYANATE POLYMERS

Yutaka Matsui, Hyogo; Kiyoshi Yasuda, Osaka, and Jugo Goto, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sept. 10, 1969, Ser. No. 856,833
Claims priority, application Japan, Sept. 11, 1968, 43/65366
Int. Cl. C07d *55/38*
U.S. Cl. 260—248 NS 8 Claims

This invention relates to the production of isocyanate polymers. Xylylene ω, ω'-diisocyanate trimers are produced that are devoid of 1-nylon-type polymers. Xylylene ω, ω'-diisocyanate is contacted with a trimerization catalyst and a 1-nylon-formation suppressor selected from acid amides, acid imides, ureides, thioureides or mixtures thereof.

3,609,150

VINYL 2,2-DIMETHYL-3-MARPHOLINOCARBONYLCYCLOBUTANE ACETATE

Glen W. Hedrick, Lake City, Fla., and Frank C. Magne, New Orleans, La.

Division of Ser. No. 647,343, June 30, 1967, Pat. No. 3,544,529.
Filed Aug. 6, 1969, Ser. No. 870,850
Int. Cl. C07d *87/36*
U.S. Cl. 260—247.2 B 1 Claim

The invention provides certain vinyl ester amides of pinic acid, particularly vinyl 2,2-dimethyl-3-morpholinocarbonyl-cyclobutane acetate, which can be prepared by selective amination followed by vinyl interchange, and are copolymerizable with vinyl chloride.

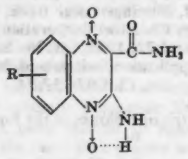
3,609,151

2-AMINO-3-CARBAMIDO-QUINOXALINE-DI-N-OXIDES AND THEIR PRODUCTION

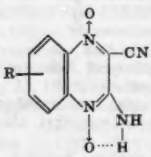
Florin Seng, Cologne; Kurt Ley, Odenthal; Karl Georg Metzger, Wuppertal-Elberfeld, and Dieter Fritsche, Wuppertal-Vohwinkel, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 3, 1968, Ser. No. 742,168
Claims priority, application Germany, July 26, 1967, F 53057
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 8 Claims

2-Amino-3-carbamido-quinoxaline-di-N-oxides of the formula



are produced by hydrolising the corresponding 2-amino-3-cyano-quinoxaline-di-N-oxides of the formula



in an acidic solution wherein R is hydrogen, halogen, lower alkyl or lower alkoxy. The compounds are useful in treatment of infections from grampositive and gramnegative bacteria and are administered in the general range of 25 mg./kg. orally or parenterally.

3,609,152

CERTAIN 2-AMINO-3,4-DIHYDROGEN-INAZOLIN-4-ONES AND 4-THIONES

Hans-Jurgen E. Hess, and Gerald F. Holland, both of Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation of application Ser. No. 576,549, Sept. 1, 1966, now abandoned, which is a continuation-in-part of application Ser. No. 442,205, Mar. 23, 1965, now abandoned. This application Jan. 28, 1970, Ser. No. 7,347
Int. Cl. C07d *51/48*
U.S. Cl. 260—256.5 R 17 Claims

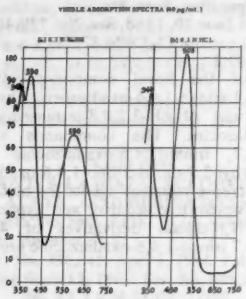
Substituted 2-amino-3,4-dihydroquinazoline-4-one and substituted 2-amino-4-(3H)-quinazolinethionone and their utility as antihypertensive agents.

3,609,153

1 HYDROXY 6 METHOXY PHENAZINES

Fred D. Cook, Edmonton, Alberta; Oliver E. Edwards, Ottawa, Ontario; Douglas C. Gillespie, Ottawa, Ontario, and Edwin R. Peterson, Ottawa, Ontario, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Continuation-in-part of application Ser. No. 538,639, Mar. 30, 1966, now abandoned. This application Apr. 20, 1967, Ser. No. 632,455
Int. Cl. C07d *51/80*
U.S. Cl. 260—267 4 Claims



Unsymmetrical 1-hydroxy-6-substituted phenazines and their N-oxides have been prepared from 1,6-disubstituted phenazines by forming the 1-hydroxy compound and oxidizing to form the 10-oxide and the 5,10-dioxide. The substituent in the 6 position is preferably lower alkoxy but may also be lower alkyl. The 1-hydroxy-6-substituted-5,10-dioxide compounds are antibiotics useful inter alia in agriculture. Myxin is the name given to the microbiologically produced compound, employing strains CBRI 903 and 904, type 3C Sorangium.

3,609,154

2-(ARYLPROPYL)-1,2,3,4-TETRAHYDROISOQUINOLINES, INTERMEDIATES AND PROCESSES

Graham Alwyn Fothergill, Knebworth, and John Mervyn Osbond, The Ryde, Hatfield, both of England, assignors to Hoffmann-La Roche, Inc., Nutley, N.J.

Filed Nov. 12, 1968, Ser. No. 775,583
Claims priority, application Great Britain, Nov. 30, 1967, 54477/67
Int. Cl. C07d *33/38*
U.S. Cl. 260—289 R 12 Claims

2-(Arylpropyl)-1,2,3,4-tetrahydroisoquinolines, prepared inter alia, by condensing the corresponding 1,2,3,4-tetrahydroisoquinolines and arylpropyl halides, are described. The end products are useful as analgesics and amoebicides.

3,609,155
1-PARA-CHLOROPHENYL-1,5,6,7,8,8a-HEXAHYDROIMIDAZO[1,5-a]PYRIDINES AND INTERMEDIATES THEREFOR

Albert J. Frey, Essex Fells, and Robert E. Manning, Mountain Lake, both of N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

Division of Ser. No. 672,990, Oct. 5, 1967, Pat. No. 3,467,662. Filed Apr. 15, 1969, Ser. No. 816,404
Int. Cl. C07d *49/34*
U.S. Cl. 260—293 DD **5 Claims**

This disclosure pertains to novel 1-substituted 2-unsubstituted imidazopyridines, for example 1-p-chlorophenyl-3-loweralkylthio-1,5,6,7,8,8a-hexahydroimidazo[1,5-a]pyridene. These compounds are useful as hypotensive agents.

3,609,156
PROCESS FOR PREPARING 1,3-PROPANEDIOL DERIVATIVES

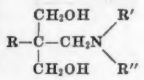
Hideaki Munakata; Kazuo Watanabe; Yoshikazu Arimatsu, and Masakazu Tanaka, all of Otsu-shi, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan

Filed Jan. 12, 1970, Ser. No. 2,404
Claims priority, application Japan, Jan. 18, 1969, 44/3557
Int. Cl. C07d *29/16*
U.S. Cl. 260—294.7 **4 Claims**

Process for preparing 1,3-propanediol derivatives which comprises reacting an oxetane compound of the formula:

wherein R is a lower alkyl group substituted or not with halogen, aryl, hydroxyl, lower alkoxy or aryloxy with an amine of the formula:

wherein R′ is a hydrogen atom, a lower alkyl group or a cycloalkyl group and R″ is a lower alkyl group or a cycloalkyl group or, when taken together with the adjacent nitrogen atom, they represent a nitrogen containing saturated heterocyclic group in the presence of a phenol to give a 1,3-propanediol compound of the formula:



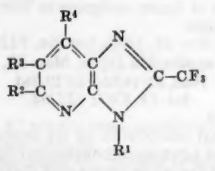
wherein R, R′ and R″ are each as defined above.

3,609,157
SUBSTITUTED IMIDAZOPYRIDINES

Leslie Thomas Allan, Cambridge; Geoffrey Tattersall Newbold, Saffron Walden, and Albert Percival, Hauxton, all of England, assignors to Fisons Pest Control Limited, Harston, Cambridgeshire, England

Filed May 17, 1968, Ser. No. 729,899
Claims priority, application Great Britain, May 23, 1967, 23803/67
Int. Cl. C07d *31/36*
U.S. Cl. 260—295 **5 Claims**

Substituted imidazopyridines of the formula



and physiological active salts and N-oxides thereof, wherein R^1 represents R^5 or $COOR^5$ wherein R^5 represents alkenyl of 2 to 4 carbon atoms, alkynyl of 2 to 4 carbon atoms, aralkyl of 7 to 13 carbon atoms or cycloalkyl of 3 to 6 carbon atoms and wherein R^2, R^3 and R^4 are the same or different and represent hydrogen, halogen, alkyl of 1 to 6 carbon atoms, nitro or cyano are biocidally active and are particularly useful as herbicides.

3,609,158
CERTAIN SUBSTITUTED (PYRIDYL)-OXY ACETIC ACID DERIVATIVES

Florence E. Torba, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 17, 1969, Ser. No. 807,980
Int. Cl. C07d *31/34*
U.S. Cl. 260—295 **2 Claims**

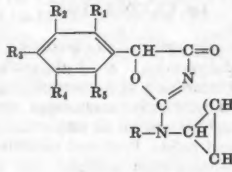
Disclosed as novel compounds are (trifluoromethyl)pyridine derivatives which are substituted by a hydroxy, mercapto, alkoxy, loweralkenoxy, aryloxy, alkylthio, arylthio, alkylsulfonyl, arylsufonyl, amino, hydrazino or oxyloweralkanoic acid or acid derivative group and optionally by chlorine and/or fluorine. Any remaining positions on the pyridine ring are taken up by hydrogen. The compounds have utility as herbicides and as active constituents of various miticidal, anthelmintic, fungicidal and bacteriocidal compositions.

3,609,159
5-PHENYL-2-CYCLOPROPYLAMINO-4-OXAZOLINONE, AND PROCESS FOR MAKING THE SAME

Don Pierre R. L. Guidicelli, Val de Marne, and Henry Najer, Paris, both of France, assignors to Les Laboratoires Dausse, Paris, France

Continuation-in-part of application Ser. No. 580,908, Sept. 21, 1966, now abandoned , Continuation-in-part of application Ser. No. 348,296, Feb. 28, 1964, now abandoned. This application July 21, 1967, Ser. No. 655,002
Int. Cl. C07d *85/30*
U.S. Cl. 260—307 A **2 Claims**

New 5-aryl-2-cycloalkylamino-4-oxazolinones of the formula:



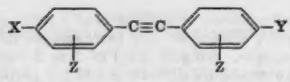
in the form of racemate or optical isomer and its acid addition salts, wherein R_1, R_2, R_3, R_4 and R_5 are each hydrogen, halogen, trifluoromethyl, lower alkyl, lower alkoxy, amino, amino substituted by one or two alkyl, cycloalkyl or aryl radicals, or by an aliphatic, alicyclic or aromatic acyl radical, an aliphatic, alicyclic or aromatic acyl radical, alkylmercapto, sulphonamido, mono- or di-substituted sulphonamido, cyano, or a substituted or unsubstituted carbamoyl radical; *n* is 1, 2, 3 or 4; and R is hydrogen, lower alkyl, cycloalkyl, or lower ω-hydroxyalkyl are useful as stimulants of the central nervous system and as anorexic agents.

3,609,160
P,P′-BIS(BENZOXAZOLYL) TOLAN DERIVATIVES

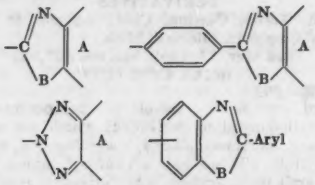
Hans Rudolf Meyer, Basel; Peter Liechti, Binningen; Kurt Weber, Basel, and Adolf Emil Siegrist, Basel, all of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed Aug. 9, 1967, Ser. No. 659,343
Claims priority, application Switzerland, Aug. 15, 1966, 11756/66
Int. Cl. C07d *49/38, 55/04;* C01d *85/48*
U.S. Cl. 260—307 D **2 Claims**

The invention relates to new tolan derivatives of the general formula



where Z stands for a hydrogen atom, a free or functionally modified carboxyl group, a free or functionally modified sulfonic acid group, Y for one of the groupings



or for an s-triazinyl residue bound through a cyclic carbon atom, a pyrazolyl, oxdiazolyl, thiadiazolyl, furyl, thienyl, cumaryl, quinazolyl, pryidyl or pyrimidyl residue, in which groupings A represents a benzene or naphthalene residue condensed with the heterocycle in the indicated manner, and B represents a bridge member -O-, -S-, or NQ-, where Y stands for hydrogen or an unsubstituted or substituted alkyl group, and X stands for a group Y, a hydrogen or halogen atom, in alkoxy group, an unsubstituted or substituted alkyl group or aryl group, an aralkyl, amino, alkylamino, ureido group, a substituted ureido group, a urethane, carboxylic acid ester or amide group or an acylamino group.

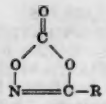
3,609,161
THERMOSETTING ACRYLICS CONTAINING OXAZOLINE GROUPS
Rostyslaw Dowbenko, Gisbonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Sept. 6, 1967, Ser. No. 665,745
Int. Cl. C07d *85/36*
U.S. Cl. 260—307 **4 Claims**

Novel polymerizable unsaturated oxazoline compounds are obtained by dehydrating a hydroxyalkyl-substituted aminoethanol and esterifying or transesterifying the resulting alcohol with an ethylenically unsaturated monocarboxylic acid, an ester of such an acid, or an ethylenically unsaturated monocarboxylic acid halide. Preferred embodiments include 2,4-dialkyl-2-oxazoline-4-alkyl acrylates and methacrylates. Polymers of such compounds, and particularly their interpolymers with other ethylenic monomers provide thermosetting film-forming compositions, useful as protective coatings and adhesives.

Vinyl interpolymers are useful in coatings because of their excellent durability and weatherability, solvent resistance, and adhesion. However, it is difficult to obtain vinyl polymers having the combination of properties necessary to provide coatings of overall utility for many applications. For instance, cured coatings of sufficient adhesion and hardness tend to have insufficient flexibility for many desired uses, and compositions having suitable application characteristics often are deficient in coating properties. Thus, polymers which can provide improvement in several properties without sacrificing others are of continuing and increasing interest.

3,609,162
CYCLOALIPHATIC MONO (NITRILE CARBONATES)
Emmett H. Burk, Jr., Glenwood, Ill., and Donald D. Carlos, Crown Point, Ind., assignors to Atlantic Richfield Company, New York, N.Y.
Continuation-in-part of application Ser. No. 651,380, July 6, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 502,328, Oct. 22, 1965, now abandoned.
This application Dec. 5, 1968, Ser. No. 781,586
Int. Cl. C07d *85/06*
U.S. Cl. 260—307 **13 Claims**

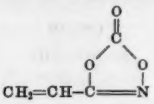
The disclosure is of compounds of the formula



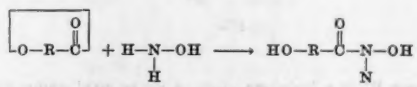
wherein R is a cycloaliphatic radical. The synthesis can be performed by reacting the corresponding hydroxamic acids with phosgene. The compounds can be decomposed to yield the corresponding cycloaliphatic monoisocyanates.

3,609,163
PROCESS FOR PREPARING 5- VINYL-1,3,4-DIOXCAZOL-2-ONES
Emmett H. Burk, Jr., Glenwood, Ill., and Donald D. Carlos, Crown Point, Ind., assignors to Atlantic Richfield Company
Continuation-in-part of application Ser. No. 681,925, Nov. 9, 1967, now Patent No. 3,480,595, Continuation-in-part of application Ser. No. 592,285, Nov. 7, 1966, now abandoned.
This application Feb. 10, 1969, Ser. No. 798,186
Int. Cl. C07d *85/00*
U.S. Cl. 260—307 **15 Claims**

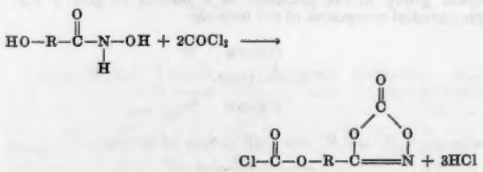
A multistep process for preparing ethylenically unsaturated cyclic nitrile carbonate compounds such as ethene nitrile carbonate,



is disclosed. A lactone is first reacted with hydroxylamine to obtain a hydroxyl group-containing monohydroxamic acid:



The hydroxamic acid is then phosgenated to obtain a cyclic nitrile carbonate group-containing chloroformate:



The chloroformate is then contacted with an organic, tertiary amine having a pK value below about 5 to effect decarboxylation and dehydrochlorination of the chloroformate and production of an ethylenically unsaturated cyclic nitrile carbonate compound such as ethene nitrile carbonate, shown above.

3,609,164
PROCESS FOR PREPARING -BUTOXYCARBONYL COMPOUNDS
Munetugu Miyoshi, Nishinomiya-shi, and Takanobu Oonishi, Osaka-shi, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan
Filed May 29, 1968, Ser. No. 732,888
Claims priority, application Japan, Mar. 27, 1968, Mar. 17, 1968, 43/19,862;43/19,861
Int. Cl. C07c *125/04*
U.S. Cl. 260—309 **8 Claims**

t-butoxycarbonyl compounds as for example t-butoxycarbonylhydrazide or t-butoxycarbonylamino acid, are prepared by reacting hydrazine or an amino acid directly with t-butoxycarbonyl chloride. The reaction is conducted in an aqueous medium, usually at a temperature of −10° to 30° C.

3,609,165

1,3-DIAZABICYCLO [3.1.0] HEX-3-ENES

Harold W. Heine, Lewisburg; Richard H. Weese, Morrisville, and Robert A. Cooper, Knoxville, all of Pa., assignors to Research Corporation, New York, N.Y.

Filed July 19, 1968, Ser. No. 745,980
Int. Cl. C07d 49/30
U.S. Cl. 260—309.6 1 Claim

4,6-diaryl-1,3-diazabicyclo [3.1.0] hex-3-enes are made by reacting trans-2-aryl-3-aroylaziridines with aldehydes and ketones in ammoniacal alcohol. The new compounds and their acid addition salts are photochromic.

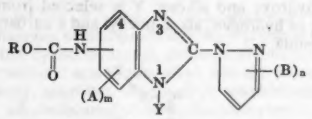
3,609,166

CARBAMIC ACID ESTERS OF BENZIONIDAZOLES

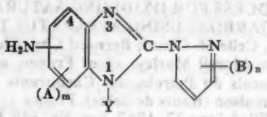
Walter Gauss, Cologne-Stammheim; Heinz Herlinger, Korb/Waiblingen; Herbert Thomas, Wuppertal-Elberfeld, and Manfred Plempel, Wuppertal-Elberfeld, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 19, 1968, Ser. No. 753,716
Claims priority, application Germany, Aug. 29, 1967, F 53346 IVd/12p
Int. Cl. C07d 49/38
U.S. Cl. 260—309.2 17 Claims

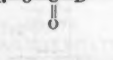
Carbamic acid esters are provided which, inter alia, have anthelmintic action against nematodes and fungicidal activity against *Aspegillus niger*, *fumigatus* and *nidulans*, *Trichophyton* species and *Candida albicans* at concentrations as low as 4 γ/ml. The esters have the formula:



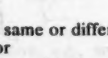
in which
Y is hydrogen or alkyl,
A and B are the same or different and are each hydrogen, halogen, nitro, lower alkyl or lower alkoxy,
m and *n* are 1 or 2, and
R is substituted or unsubstituted aliphatic, aralkyl, aryl or heterocyclic, and are prepared by reacting an amine of the formula:



In which
Y is hydrogen or alkyl,
A and B are the same or different and are each hydrogen, halogen, nitro, lower alkyl or lower alkoxy, and
m and *n* are 1 or 2, with a carbonic acid derivative of the formula:



in which
R is unsubstituted or substituted aliphatic, aralkyl, aryl, or a heterocyclic radical, and
D is halogen, OR^1 or



wherein R^1 and R^2 are the same or different and have any of the above meanings of R, or
R and D further being the residual constituents of the ring system of glycol carbonate and benzocatechol carbonate.

3,609,167

IBENZO[b,e] THIEPINES

Charles L. Zirkle, Berwyn, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

Filed Apr. 2, 1962, Ser. No. 184,513
Int. Cl. C07d 67/00
U.S. Cl. 260—327 B 3 Claims

Disclosed are dibenzo [*b,e*]-oxepin and dibenzo [*b,e*] thiepin-11-one useful as intermediates for the preparation of corresponding 11-aminoalkylated derivatives which have pharmaceutical activity.

3,609,168

THIADIAZEPINES

Raymond Bourdon, and Sylvie Ranisteano, both of Paris, France, assignors to Societe d'Etudes, de Recherches et d'Applications, Scientifiques et Midicales E.R.A.S.M.E. (Societe Anonyme Francaise), Paris, France

Filed Aug. 8, 1967, Ser. No. 659,001
Claims priority, application Great Britain, Aug. 12, 1966, 36306/66
Int. Cl. C07d 93/00
U.S. Cl. 260—327 R 3 Claims

The invention comprises derivatives of 2,7-dihydro-3,6-diphenyl-thiadiazepine; these derivatives have pharmaceutical interest as choleretics, though the parent compound has previously shown no medical properties. Preparation of the derivatives constituting the novel compounds of the invention involves four steps, comprising fixation of desired substituents on an aromatic ring, acylation, fixation of a sulfur atom and cyclization. Detailed examples of this preparation are given, together with information on the chemical and medical properties of the compounds.

3,609,169

METHOD OF PREPARING 3,9-BIS-(AMINOALKYL)-2,4,8,10-TETROXASPIRO [5,5]UNDECAN

Kazumi Iijima, Kawasaki-shi; Yoshioki Komachiya, Yokohama-shi, and Eiji Negoro, Kawasaki-shi, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed May 8, 1968, Ser. No. 727,686
Claims priority, application Japan, May 12, 1967, 42/30131
Int. Cl. C07d 15/04
U.S. Cl. 260—340.7 3 Claims

The yield of 3,9-bis(aminoalkyl)-2,4,8,10-tetroxaspiro [5,5] undecanes from the catalytic hydrogenation of the corresponding 3,9-bis(cyanoalkyl)-2,4,8,10-tetroxaspiro [5,5]undecanes is increased over known methods, and the recovery of the product from the hydrogenation mixture is facilitated if the dinitrile is hydrogenated in the molten condition in the presence of ammonia and a Raney cobalt or nickel formate catalyst in the absence of a solvent or diluent.

3,609,170

PROCESS FOR OPTICAL RESOLUTION AND PRODUCTS RESULTING THEREFROM

Edward Warren Cantrall, New City, N.Y.; Charles Krieger, Clifton, N.J., and Robert Bruce Brownfield, Fairfield, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 753,889, Aug. 20, 1968, now abandoned. This application May 20, 1969, Ser. No. 826,256
Int. Cl. C07c 169/08
U.S. Cl. 260—397.4 9 Claims

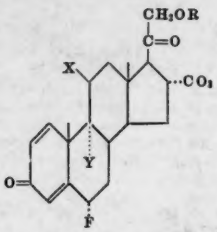
This invention relates to the optical resolution of racemic organic compounds using 2-aminobutanol as the resolving agent. The process is particularly useful in the resolution of keto and hydroxysteroids. The steroids are useful as estrogens or progestational agents or convertible into such agents.

3,609,171
11-HALOGEN-SUBSTITUTED STEROIDS

Henry Laurent; Ulrich Kerb; Karl Heinz Kolb; Rudolf Wiechert, and Erich Gerhards, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Filed Aug. 15, 1968, Ser. No. 753,034
Claims priority, application Germany, Aug. 16, 1967, P 16 43 036.7
Int. Cl. C07c *169/30*
U.S. Cl. 260—397.45 26 Claims

11-halogen-substituted-steroids of the formula



wherein R is hydrogen or a cyl and X and Y are halogen, the molecular weight of Y being at least equal to that of X.

The products of the invention are useful for pharmaceutical applications to reduce inflammations.

3,609,172
NEW STEROID DERIVATIVES

Gianfranco Intelisano, Milan, Italy, assignor to Italchemi-Instituto Chimico Farmaceutico S.r.l., Milan, Italy

Filed Oct. 23, 1968, Ser. No. 770,081
Claims priority, application France, Oct. 21, 1968, 126488
Int. Cl. C07c *169/32*
U.S. Cl. 260—397.45 4 Claims

New 21-esters of steroids of formula

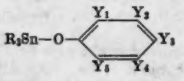
St—OCO $(CH_2)_5$—NH—$COCH_3$ wherein St represents a steroid residue from pregnadiene series, the ester group being attached to the carbon at 21- position of the steroid residue. These compounds have a more useful antianaphylactic and antiinflammatory activity than the starting steroids. They are prepared by reacting the suitable steroid with E-acetamidocaproyl chloride in an organic solvent, in the presence of a hydrogen-chloride-binding agent.

3,609,173
TRICYCLOHEXYLTIN PHENOLATES AND THE PREPARATION THEREOF

Bernard G. Kushlefsky, Edison, N.J., and Wendall K. Whitney, Midland, Mich., assignors to M & T Chemicals Inc., Greenwich, Conn., by said Kushlefsky and The Dow Chemical Company, Midland, Mich., by said Whitney

Filed Aug. 2, 1968, Ser. No. 749,625
Int. Cl. C07f *7/22*; A01n *9/24*
U.S. Cl. 260—429.7 18 Claims

This invention comprises novel tricyclohexyltin compounds of the formula



wherein R is cyclohexyl and $Y_{1\text{-}5}$ are the same or different and Y is selected from the group consisting of alkyl, aryl, cycloalkyl, halogen, nitro, mercapto, cyano, and hydrogen such that not more than four Y substituents are hydrogen. This invention also comprises methods of preparing said novel compounds. This invention also comprises pesticidal compositions containing as active components said novel compounds.

3,609,174
W-TRICHLOROMETHYL-FLUOROALKYLSILANES

Arthur G. Smith, and Yung Ki Kim, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 1, 1969, Ser. No. 846,956
Int. Cl. C07f *7/08, 7/12*
U.S. Cl. 260—448.2 R 4 Claims

Organopolysiloxanes, containing

$$CCl_3(CF_2)_nCH_2CH_2SiO-$$

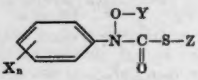
units, prepared from novel silanes such as $Cl_3C(CF_2)_2CH_2CH_2Si(CH_3)X_2$, where X is OH or a hydrolyzable radical, are disclosed as nonflammable fluid lubricants and nonflammable elastomers.

3,609,175
NEW SUBSTITUTED THIOCARBAMATES

Sidney B. Richter, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Oct. 27, 1967, Ser. No. 678,529
Int. Cl. C07c *155/08*
U.S. Cl. 260—455 A 10 Claims

A compound of the formula:



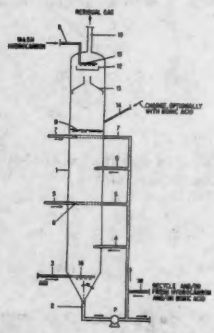
wherein *n* is an integer of from 0 to 5; X is selected from the group consisting of a halogen, an aliphatic radial, nitro, acyl, acyloxy, hydroxy and alkoxy; Y is selected from the group consisting of hydrogen, alkyl, phenyl and a carbamoyl radical of the formula:

wherein R_1 and R_2 independently are selected from the group consisting of hydrogen, alkyl and phenyl; and Z is selected from the group consisting of an aliphatic radical, a cycloaliphatic radical, aryl and aralkyl. These compounds are useful as fungicides and nematocides.

3,609,176
PROCESS FOR OXIDIZING SATURATED HYDROCARBONS USING APPARATUS THEREFOR

Jacob Alagy, Celle St. Cloud; Bernard Cha, Chatou, and Cornelis Keon, Mareil Marley, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison (Hauts de Seine), France

Filed June 27, 1967, Ser. No. 649,191
Claims priority, application France, July 7, 1966, Jan. 10, 1967, Mar. 30, 1967, 68,651;90,608;100,912
Int. Cl. C07f *5/04*; C07c *35/08*
U.S. Cl. 260—462 A 14 Claims



Hydrocarbon is oxidized in the presence of a boron compound wherein a portion of the liquid phase is continuously

withdrawn and then reinjected tangentially as a stirring liquid into the reaction zone to provide a vertical movement which minimizes deposition of boron compounds and tarry products.

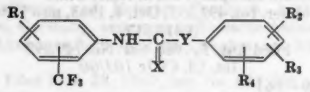
3,609,177

TRIFLUOROMETHYLPHENYL THIOCARBAMIC ACID PHENYL ESTERS

Walter Traber, Riehen; Alfred Margot, Basel, and Jean-Jacques Gallay, Birsfelden, Basel Land, all of Switzerland, assignors to Geigy Chemical Corporation, Greenburgh, N.Y.

Filed May 12, 1966, Ser. No. 549,497
Claims priority, application Switzerland, May 18, 1965, May 18, 1965, May 18, 1965, 6926/65;6927/65;6928/65
Int. Cl. C07c *155/08*, *125/06*; A61k *27/00*
U.S. Cl. 260—455 9 Claims

There are disclosed carbamates and thiocarbamates of the formula



in which each of R_1 and R_2 independently represents hydrogen, halogen or halogenoalkyl; R_3 represents hydrogen, halogen, nitro, cyano, hydroxyl, amino, carbamoyl, sulfamoyl phenoxy or sulfonic acid group, alkyl, alkenyl, halogenoalkyl, aralkyl, alkoxy, alkylthio, alkoxyalkyl, alkylthioalkyl, alkylsulphinyl, alkylsulphonyl, S-alkylsulphonylamino, alkylsulphamoyl, dialkylsulphamoyl, alkylcarbamoyl, dialkylcarbamoyl, alkylamino, dialkylamino, acylamino, acyl or carbalkoxy; R_4 represents hydrogen, halogen or alkyl; and X and Y each independently represents oxygen or sulfur. These compounds and their salts have anthelmintic properties and can be incorporated into animal feeds.

3,609,178

KETOXIME SILOXANES CURABLE WITH AMINOORGANOSILANES

Robert N. Thomas, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 1, 1969, Ser. No. 881,289
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 G 22 Claims

Ketoxime functional siloxane polymers are mixed with aminoorganoalkoxysilanes to provide a composition which cures at room temperature by exposure to moisture and is stable in the absence of moisture. The composition cures to a material which has improved adhesion to substrates, such as metal, is harder and has improved solvent resistance. The composition can be used as a protective film, such as paint or varnish.

3,609,179

LOWER ALKYL 9-CARBOXYLATES OF 9-(TERT.-AMINOBUTYNYL) FLUORENES

John F. Cavalla, Isleworth; Roy Simpson, Taplow, and Alan C. White, Windsor, all of England, assignors to John Wyeth & Brother Limited, Taplow, England

Filed Jan. 31, 1968, Ser. No. 701,824
Claims priority, application Great Britain, Feb. 13, 1967, 6777/67
Int. Cl. C07d *87/26*; C07c *101/04*
U.S. Cl. 260—471 A 5 Claims

Fluorene and Xanthene compounds bearing at the 9-position (1) a carboxyl derivative, e.g., an ester, amide, substituted amide, or hydroxymethyl and (2) a 4-tertiaryamino-2-butynyl substituent are useful as antiulcer, anti-inflammatory, anticonvulsant, and analogesic agents. The corresponding quaternary salts, e.g., their methiodides, are similarly useful.

3,609,180

PROCESS FOR PREPARING CARBOXYLIC ACID ESTERS OF UNSATURATED ALCOHOLS

Hiroshi Shigematsu, 2-6, 1-chome, Muronoki-machi Iwakuni-shi, Yamaguchi-ken, and Yasushi Shibahara, 12-35, 2-chome, Shinmachi, Otake-shi, Hiroshima-ken, both of Japan

Filed Aug. 22, 1966, Ser. No. 573,825
Claims priority, application Japan, Aug. 27, 1965, Oct. 23, 1965, Nov. 17, 1965, Dec. 21, 1965, Mar. 7, 1966, 40/51945;40/64964;40/70241;40/78364;41/13546
Int. Cl. C07c *67/04*
U.S. Cl. 260—497 A 17 Claims

A process for preparing the corresponding carboxylic acid esters of unsaturated alcohols by contacting olefins with aliphatic carboxylic acids in the presence of a gas selected from the group consisting of oxygen and oxygen-containing gases, using as catalyst a palladium salt and a copper salt, the improvement which comprises effecting the reaction in the presence of an organo-quaternary ammonium compound, said ammonium compound being one which does not have hydrogen directly linked to nitrogen and which can form under reaction conditions a carboxylic acid-soluble complex with said palladium salt.

3,609,181

POLYESTERS OF POLYOXYTETRAMETHYLENE GLYCOL AND CERTAIN DIOIC ACIDS

Hyman R. Lubowitz, Canoga Park; Charles J. Rogers, Carmichael, and Raymond A. Lynch, Rancho Cordova, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force

Filed May 28, 1964, Ser. No. 371,156
Int. Cl. C07c *69/48*, *69/50*
U.S. Cl. 260—485 G 6 Claims

1. The process of making polyesters comprising the steps of heating a polyoxytetramethylene glycol having 10 to 15 oxytetramethylene groups with a dioic acid selected from the group consisting of sebacic, isosebacic, and azelaic acids, the anhydrides of said acids, and mixtures thereof at a temperature of 300° to 550° F.

6. The product formed by the process of claim 1.

3,609,182

PRODUCTION OF CYCLOOCTYL FORMATE CYCLOOCTANOL AND CYCLOOCTANONE

James Albert Baker, 5 Dove House Crescent, Farnham Royal, Slough, Buckinghamshire, and Robert Stevens, 7 Hurst Road, Slough, Buckinghamshire, both of England

Filed Dec. 6, 1967, Ser. No. 688,335
Int. Cl. C07c *45/16*, *67/04*, *69/06*
U.S. Cl. 260—497 R 7 Claims

A new route to the solvents and intermediates cyclooctanol and cyclooctanone via cyclooctyl formate is disclosed. Cyclooctyl formate may be made by acylating cyclooctene with formic acid, preferably without a catalyst, the better conversion and simplified procedure allowing the formate to be obtained at a fraction of the cost of the corresponding acetate.

3,609,183

α-[p-(DIMETHYLAMINOALKYL)PHENYL]-4-METHOXY-α'-NITROSTILBENE COMPOUNDS

Horace A. DeWald, and Martin L. Black, both of Ann Arbor, Mich., assignors to Parke Davis & Company, Detroit, Mich.

Filed Jan. 8, 1969, Ser. No. 789,950
Int. Cl. C07c *97/06*
U.S. Cl. 260—501.18 5 Claims

α-{*p*-[4-(Dimethylamino)butyl]phenyl}-4-methoxy-α'-nitro-stilbene and α- P-[5-(dimethylamino)pentyl]Phenyl - 4-methoxy-α'-nitrostilbene and acid-addition and quaternary ammonium salts thereof, useful as pharmacological agents that exhibit antiprogestational, hypocholesteremic, and antifertility activity; and their production by reacting a 1-[P-(dimethyl-aminoalkyl)phenyl]-1-(compound or a α-[p-(dimethylaminoalkyl)phenyl]with nitric acid.

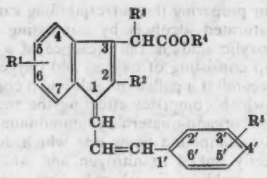
3,609,184

1-SUBSTITUTED-3-INDENYLACETIC ACID AND ESTERS

Nobuyoshi Miyai, Takarazuka-shi; Kei Takahashi, Takarazuka-shi, and Hisao Yamamoto, Nishinomiya-shi, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka-shi, Osaka-fu, Japan

Filed Sept. 10, 1968, Ser. No. 758,697
Claims priority, application Japan, Sept. 11, 1967, 42/58538
Int. Cl. C07c *65/14, 69/76*
U.S. Cl. 260—520 3 Claims

Indene derivatives of the formula:



wherein R^1 is hydrogen, halogen, lower alkyl, lower alkoxy or lower alkylthio, R^2 is hydrogen or lower alkyl, R^3 is hydrogen, lower alkyl or phenyl, R^4 is hydrogen, lower alkyl or phenyl (lower) alkyl and R^5 is hydrogen, halogen, lower alkyl or lower alkoxy. The compounds are useful as anti-inflammatory agents.

3,609,185

PRODUCTION OF ORGANIC ACIDS

Bertram Yeomans, Hessle, Alan Frederick Parkes, Holderness, Hull, both of, England, assignor to B. P. Chemicals, (U.K.) Limited, London, England

Filed June 23, 1969, Ser. No. 835,778
Claims priority, application Great Britain, June 29, 1968, Jan. 6, 1969, 3/222/68;778/69
Int. Cl. C07c *55/02*
U.S. Cl. 260—533 A 12 Claims

Di-neocarboxylic acids are produced by reaction of an α,α^1 dialkyl substituted monoolefin in which the alkyl groups are separated by at least three carbon atoms, or an unconjugated α,α^1 dialkyl substituted diolefin with formic acid in the presence of concentrated sulfuric acid or with carbon monoxide in the presence of a mineral or Lewis acid.

3,609,186

BORYL SULFONATES AND SULFATES

Swiatoslaw Trofimenko, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 20, 1968, Ser. No. 753,855
Int. Cl. C07f *5/02*
U.S. Cl. 260—545 R 12 Claims

Dihydrocarbylboryl sulfonates and bis(dihydrocarbylboryl) sulfonates and sulfates, e.g., diethylboryl p-toluene sulfonate, bis(diethylboryl) 4,4'-biphenyldisulfonate and bis(diethylboryl) sulfate, useful as transfer agents for the hydrocarbylboryl groups, are prepared by reaction between selected hydrocarbylboranes and an anhydrous sulfonic or sulfuric acid.

3,609,187

N,N-DISUBSTITUTED TRIFLUOROMETHANESULFONAMIDES

George G. I. Moore, White Bear Lake, and Alvin C. Conway, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 14, 1969, Ser. No. 816,090
Int. Cl. C07c *143/74*
U.S. Cl. 260—556 F 8 Claims

By reacting N-alkyl- and N-alkenyltrifluoromethanesulfonamides with certain aroyl halides or anhydrides there are obtained N-aroyl-N-alkyl- and N-aroyl-N-alkenyltrifluoromethanesulfonamides having physiological activity as anticonvulsant agents.

3,609,188

4-DEDIMETHYLAMINO-4-SUBSTITUTED-AMINO-6-DEMETHYLTETRACYCLINES

Robert Carlyle Esse, Pearl River, N.Y., and George Madison Sieger, Montvale, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of application Ser. No. 380,668, July 6, 1964, now abandoned , which is a continuation-in-part of application Ser. No. 305,829, Aug. 30, 1963, now abandoned , which is a continuation-in-part of application Ser. No. 233,946, Oct. 29, 1962, now abandoned. This application Oct. 29, 1964, Ser. No. 407,540
Int. Cl. C07c *103/19*
U.S. Cl. 260—559 AT 22 Claims

This disclosure describes compounds of the class of 4-dedimethylamino-4-substituted-amino-6-demethyltetracyclines useful as antibacterial agents.

3,609,189

NOVEL MULTIFUNCTIONAL HYDROXY COMPOUNDS AND METHODS FOR THE PREPARATION THEREOF

Clarence R. Bresson, and Raymond L. Cobb, both of c/o Phillips Petroleum Company, Bartlesville, Okla.

Dvision of Ser. No. 492,892, Oct. 4, 1965, now Patent No. 3,414,617.
Filed Aug. 5, 1968, Ser. No. 749,990
Int. Cl. C07c *103/00*
U.S. Cl. 260—561 4 Claims

N-alkylated derivatives of 2-amino-2-hydrocarbylthiomethyl-1-1,3-propanediols, useful as flotation agents, rubber modifiers, and chelating agents in the separation of metals, are produced by reacting 2-amino-2-hydrocarbylthiomethyl-1,3-propanediols with organic halides. Thiols can be produced by reacting arylmethylated or alkarylmethylated derivatives of the above compounds with an alkali metal in the presence of ammonia.

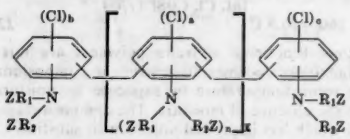
3,609,190

POLYAMINATED DERIVATIVES OF POLYCHLOROPOLYPHENYLBENZENES

Lucien Sobel, Grenoble, and Ludovic Parvi, Pont de Claix, both of France, assignors to Ugine Kuhlman, Paris, France

Continuation-in-part of application Ser. No. 424,848, Jan. 11, 1965, now abandoned. This application Nov. 24, 1967, Ser. No. 685,306
Int. Cl. C07c *91/42*
U.S. Cl. 260—570.5 1 Claim

A polyaminated derivative of polychlorinated polyphenylbenzenes higher than diphenyl, useful as an anti-ignition additive in polymer-type materials such as polyesters and having a general formula:



prepared at a temperature between 70° and 300° C. by the reaction of an aminated compound containing members R_1Z and R_2Z with at least one polyhalogenated polyphenylbenzene R_1Z and R_2Z are members selected from the group consisting of an atom of hydrogen and a functional group formed by a radical R_1 and R_2 and by a terminal group Z, said radicals R_1 and R_2 being selected from the group consisting of a saturated aliphatic having from two to eight carbon atoms and an aromatic, said terminal group Z being a member selected from the group consisting of —OH, $-NH_2$, CH_3.

3,609,191

POLYETHYLENE IMINE BORANES AND THEIR PREPARATION

Robert C. Wade, Ipswich, Mass., assignor to Ventron Corporation, Beverly, Mass.

Filed June 4, 1969, Ser. No. 834,584
Int. Cl. C07c *87/20*
U.S. Cl. 260—583 A 3 Claims

This invention relates to polyethylene imine boranes. They are prepared by reacting a polyethylene imine having a

molecular weight from 600 to 100,000 with THF:BH_3 in tetrahydrofuran. The presently preferred boranes are prepared as above indicated using a polyethylene imine having a molecular weight between 600 and 1800. The solvent and reactants should be as anhydrous as possible. The properties vary with the amount of amino groups which are complexed to borane groups. Thus, the boranes made by reacting 1 BH_3 group for each 4 to 100 amino groups are viscous liquids which are fairly soluble in water and organic solvents including benzene. They are very substantive to anionic substrates and are useful for reductive bleaching and as stabilizing agents for cellulose, clay, etc. When a greater number of amino groups are converted to borane groups, such as 1 borane group for each 2 to 4 amino groups of the polyethylene imine, the products are extremely viscous polymers or solids. These products also retain slight water solubility (1 to 5%) and are useful where a more concentrated reducing activity is desired.

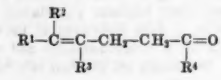
3,609,192

PRODUCTION OF ALK-1-EN-5-ONES AND ALK-1-EN-5-ALS

Werner Hoffman, and Heinrich Pasedach, both of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

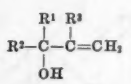
Filed Mar. 28, 1969, Ser. No. 811,598
Claims priority, application Germany, Mar. 30, 1968, P 17 68 099.8
Int. Cl. C07c *49/76, 49/20, 49/24*
U.S. Cl. 260—590 **3 Claims**

Production of alk-1-en-5-ones and alk-1-en-5-als having the general formula (I):



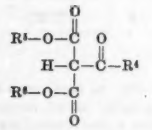
(I)

in which R^1, R^2 and R^3 each denotes a hydrogen atom or a hydrocarbon radical having from one to 40 carbon atoms which may be joined together in pairs to form five-membered to seven-membered rings and which may contain oxygen atoms as heteroatoms and in which R^4 denotes a hydrogen atom or a hydrocarbon radical having one to 40 carbon atoms which may also contain oxygen atoms as heteroatoms. Said compounds I being formed by reacting an allyl alcohol having the formula (II):



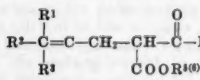
(II)

at a temperature of from 50° to 350° C. with an acyl malonate having the formula (III):



(III)

in which the radicals R^5 and R^6 denote identical or different alkyl groups having from 1 to 8 carbon atoms, and the resultant intermediate product having the general formula (IV):



(IV)

is hydrolyzed and decarboxylated.

3,609,193

PROCESS OF COUPLING ALDEHYDES AND KETONES

John Charles Leffingwell, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Continuation-in-part of application Ser. No. 595,004, Nov. 17, 1966, now abandoned. This application Apr. 30, 1969, Ser. No. 820,629
Int. Cl. C07c *49/76, 49/26, 49/12*
U.S. Cl. 260—590 **8 Claims**

A process for producing coupling products from aldehydes and ketones by treating such compounds with manganese dioxide or nickel peroxide.

3,609,194

POLYPHENYLEMETHYL PHOTOCHROMIC COMPOUNDS

Gerard Ernest Gerhardt, Warren Township, Somerset County, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 16, 1968, Ser. No. 729,515
Int. Cl. C07c *49/76*
U.S. Cl. 260—591 **5 Claims**

A class of photochromic compounds characterized by the formula:

$$A—CH_2—B$$

wherein A is a moiety of an aromatic compound A—H having an efficient rate of intersystem crossing from the singlet state to the triplet state, and B is a moiety of a linear polyphenyl having the first triplet state below the first triplet state of A—H.

3,609,195

PREPARATION OF AROMATIC ALDEHYDES BY OXIDATION

Ellis K. Fields, Chicago, Ill., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 597,869, Nov. 30, 1966, now abandoned. This application Apr. 10, 1969, Ser. No. 815,201
Int. Cl. C07c *47/52*
U.S. Cl. 260—599 **3 Claims**

A process for preparing aromatic aldehydes which process consists of oxidizing substituted or unsubstituted toluene, xylene, pseudocumene with a molecular oxygen-containing gas in the presence of 0.1 to 25 moles of nitrobenzene.

3,609,196

ETHER COMPOUNDS

Ross C. Terrell, Plainfield, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.

Continuation of application Ser. No. 727,004, May 6, 1968, now abandoned. This application Mar. 2, 1970, Ser. No. 15,308
Int. Cl. G07c *43/00, 43/12*
U.S. Cl. 260—614 F **1 Claim**

The present invention relates to the novel compounds 1,1,2,2-tetrafluoroethyl trichloromethyl ether ($CHF_2CF_2OCCl_3$); 1,1,2,2-tetrafluoroethyl dichloromethyl ether ($CHF_2CF_2OCHCl_2$); and 1,1,2,2-tetrafluoroethyl fluorochloromethyl ether ($CHF_2CF_2OCHFCl$). The compounds are prepared through selective stepwise chlorination and fluorination of 1,1,2,2-tetrafluoroethyl methyl ether. The compounds are useful as anesthetics and as solvents and dispersants of fluorinated materials.

3,609,197

PREPARATION OF A TERPENE ALCOHOL

John C. Leffingwell, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Mar. 8, 1968, Ser. No. 711,500
Int. Cl. C07c *35/18;* **C11b** *9/00*
U.S. Cl. 260—631.5 **1 Claim**

This invention relates to the synthesis of terpinene-4-01. Terpinene-4-01 is an unsaturated tertiary terpene alcohol which occurs naturally in a number of essential oils. It finds

use as a component in synthetic essential oils which are compounded for use as flavors or perfumes.

3,609,198

PROCESS FOR THE CONTINUOUS MANUFACTURE OF GLYCERIN BY SIMULTANEOUS REACTION AND WATER-ADDITION AZEOTROPIC DISTILLATION

Kazuo Yamagishi, Tokyo; Osamu Kageyama, Iruma-gun, Saitama; Hideo Arai, Iruma-gun, Saitama, and Hideaki Masaki, Ohtake-shi, all of Japan, assignors to Daicel Ltd., Osaka, Japan

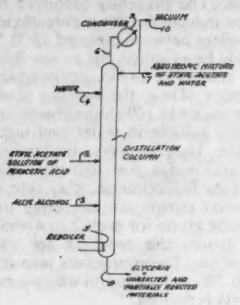
Filed Jan. 2, 1969, Ser. No. 788,360

Claims priority, application Japan, Feb. 14, 1968, 43/9265

Int. Cl. B01d *3/36*; C07c *31/22*

U.S. Cl. 260—635 H **7 Claims**

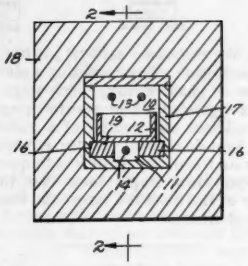
A process for producing glycerin by a reaction between peracetic acid and allyl alcohol, without using a catalyst, in which a lower fatty acid ester solution of peracetic acid and allyl alcohol are fed into a distillation column and water is fed into the distillation column at a higher position so that an azeotropic mixture of the lower fatty acid ester and water is



removed from the top of the column and an aqueous solution of glycerin is removed from the bottom of the column.

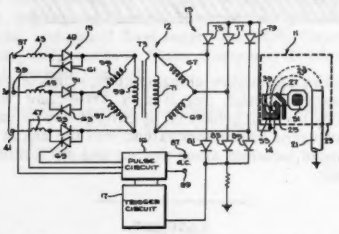
ELECTRICAL

3,609,199
PUSH-THROUGH FURNACE WITH GRAPHITE ROD HEATING
Fritz Krall, Hanau/Main, and Fritz Kalbfleisch, Lieblos, both of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt (Main), Germany
Filed Aug. 29, 1969, Ser. No. 854,149
Claims priority, application Germany, Sept. 27, 1968, P 17 83 069.2
Int. Cl. F27b *9/06, 9/36*
U.S. Cl. 13—20 **2 Claims**



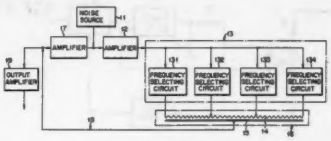
An electrically heated push-through furnace for the sintering of powder metallurgy molded parts and containing an elongated chamber is provided with a plurality of graphite rods parallel to the longitudinal axis of the chamber. The rods do not touch the walls of the chamber.

3,609,200
POWER SUPPLY
Emmett R. Anderson, Berkeley, Calif., assignor to Air Reduction Company, Incorporated, New York, N.Y.
Continuation-in-part of application Ser. No. 675,902, Oct. 17, 1967, now Patent No. 3,544,913. This application July 23, 1970, Ser. No. 57,514
Int. Cl. H05b *7/00*
U.S. Cl. 13—31 **5 Claims**



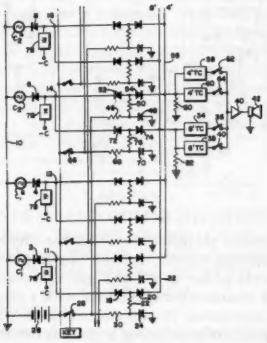
A power supply is described for use with an electron gun employed in an electron beam furnace system. The power supply includes a transformer and a rectifier connecting the secondary of the transformer to the electron beam gun for supplying current thereto. The power supply also includes a semiconductor-switching circuit connected to the primary of the transformer for supplying current to the primary. The switching circuit is controlled by a pulsing circuit, and a trigger circuit is controlled by a pulsing circuit, and a trigger circuit is connected to the pulsing circuit and to means for sensing a rise in current to the electron gun in the presence of an arc. Upon the sensing of such rise in current, the trigger circuit disables the pulsing circuit to thereby render the switching circuit inoperative and cut off current to the electron beam gun.

3,609,201
VARIABLE PITCH NARROW BAND NOISE GENERATOR
Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan
Filed Aug. 19, 1970, Ser. No. 65,240
Claims priority, application Japan, Aug. 22, 1969, Aug. 22, 1969, Aug. 22, 1969, Aug. 22, 1969, 44/66102;44/66103;44/66104;44/66105
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.01 **11 Claims**



A variable pitch narrow band noise generator comprising a noise signal source for generating a noise signal containing broad band frequency components; an amplifier for amplifying the noise signal from the source; a filter consisting of a plurality of frequency-selecting circuits supplied in common with the amplified noise signal from the amplifier, selecting different band-pass frequency components and connected in parallel in the order of the center frequency of frequency ranges of the band-pass frequency components; a normally open type variable resistor assembly consisting of an elongated resistor element and a similarly elongated flexible conductive contact element disposed adjacent to each other; a signal-circulating circuit for feeding a noise signal derived from the filter with depression of the flexible conductive contact element of the variable resistor assembly back to the amplifier so as to produce the noise signal in a narrower band form; and an output amplifier for amplifying the resultant narrow band pitch noise signal obtained from the signal-circulating circuit, whereby there can be easily obtained particularly from the output amplifier a noise signal having such a pitch sensation as is observed in a husky voice and containing a certain narrow band frequency components, the signals being capable of varying in pitch continuously as desired.

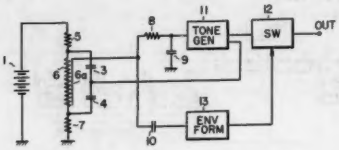
3,609,202
ELECTRONIC ORGAN GATING SYSTEM
Alfred J. Bissonette, Terrace Park, Ohio, and Walter Munch, Jr., Covington, Ky., assignors to D. H. Baldwin Comapny, Cincinnati, Ohio
Filed Apr. 8, 1966, Ser. No. 541,380
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **12 Claims**



A gating system for electronic music, wherein a pair of gates is employed to gate each tone signal, the gates being in

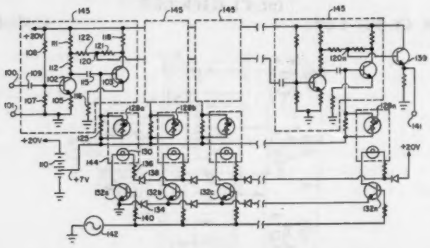
cascade for each tone signal, and each pair of gates utilizing a common first gate directly connected to a tone signal generator, followed by two parallel gates, one proceeding to a 4′ bus and one to an 8′ foot bus.

3,609,203
PARTAMENTO MUSICAL INSTRUMENT HAVING A SINGLE TONE AND ENVELOPE CONTROL
Takeshi Adachi, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan
Filed Oct. 6, 1969, Ser. No. 864,047
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.01 **1 Claim**



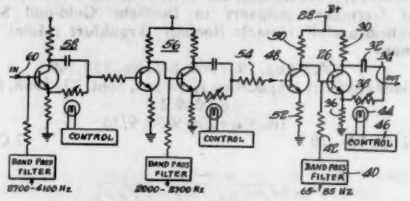
An electronic musical instrument capable of rendering tones of a monophonic continuous scale comprises a performance member including an elongated resistor and an opposing flexible contact wherein a DC current and an AC current are supplied to the elongated resistor and a mixed signal consisting of a DC control signal and an AC control signal is taken out from the flexible contact under the manipulation of the performance member, the DC control signal being varied in magnitude in correspondence to the manipulating position along the performance member, a variable frequency tone generator delivering a tone of a pitch corresponding to the magnitude of the DC component of the mixed signal obtained from the performance member, an envelope forming circuit driven by the AC component of the mixed signal for rendering an envelope signal corresponding thereto, and a switching circuit for switching a tone signal from the tone generator in accordance with the envelope signal, whereby a tone signal having a desired keying (switching) envelope can be obtained from the musical instrument.

3,609,204
VIBRATO SYSTEM FOR ELECTRICAL MUSICAL INSTRUMENT
Richard H. Peterson, 11748 Walnut Ridge Drive, Palos Park, Ill.
Filed Oct. 6, 1969, Ser. No. 864,026
Int. Cl. G01h *1/04*
U.S. Cl. 84—1.25 **2 Claims**



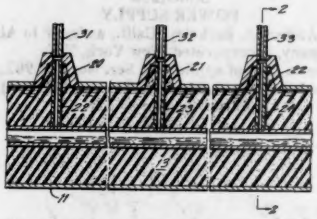
The invention relates to systems for imposing vibrato effects on electrical signals, as from the output of an electronic organ, electric guitar or other electrical musical instrument. A series of resistance-capacitance (RC) phase-shifting networks are connected in cascade, each of which, when enabled, is capable of producing a predetermined phase shift at any given frequency. The phase shift produced by all of the individual networks is cumulative. The individual phase-shifting networks are sequentially enabled seriatim, and then disabled seriatim, to produce a close approximation to true frequency modulation.

3,609,205
ELECTRONIC MUSICAL INSTRUMENT WITH PHASE SHIFT VIBRATO
Harold O. Schwartz, and Anthony C. Ippolito, both of North Tonawanda, N.Y., assignors to The Wurtilzer Company, Chicago, Ill.
Filed May 15, 1970, Ser. No. 37,634
Int. Cl. G10h *1/02*
U.S. Cl. 84—1.25 **14 Claims**



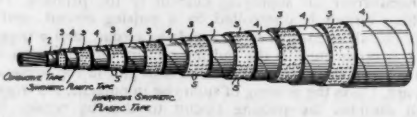
Organ or the like electronic musical instrument tones are subjected to a phase-shift vibrato utilizing a plurality of series connected stages of phase shifting, each stage comprising a capacitor and a light-dependent resistor respectively connected to the collector and emitter of a transistor. The resistance of the light-dependent resistor is varied by a lamp excited at a vibrato frequency. Different frequency bands are connected to individual stages such that the higher the frequency range of the band the larger the number of stages the band is passed through.

3,609,206
EVAPORATIVE COOLING SYSTEM FOR INSULATED BUS
Lorne D. McConnell, Radnor, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.
Filed Jan. 30, 1970, Ser. No. 7,165
Int. Cl. H01b *7/34*
U.S. Cl. 174—15 C **6 Claims**



The interior of a hollow elongated bus, which is embedded in insulation material, receives a refrigerant which is vaporized by the heat generated by current flow in the bus. A plurality of vapor conductors extend into the bus at longitudinally spaced locations along the bus and are terminated by a condenser.

3,609,207
HIGH-VOLTAGE ELECTRICAL CABLES
Gabriele Maschio, Southampton, England, assignor to Pirelli Societa Per Azioni, Milan, Italy
Filed July 10, 1968, Ser. No. 743,778
Claims priority, application Italy, July 17, 1967, 18470A/67
Int. Cl. H01b *7/02, 9/06*
U.S. Cl. 174—25 **6 Claims**



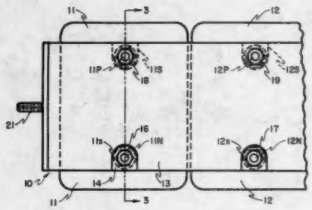
High-voltage electrical cables having tapes of synthetic plastic material which form separating insulating layers. The

tapes are formed with protuberances which facilitate the flow of insulating fluid through the cables.

3,609,208
MAGNETICALLY COMPENSATED CONNECTOR FOR ELECTRICAL CIRCUITS

Joseph L. Winpisinger, Fairview Park, Ohio, assignor to Lorain Products Corporation

Filed Sept. 21, 1970, Ser. No. 73,961
Int. Cl. H01b *7/08*
U.S. Cl. 174—32 **8 Claims**

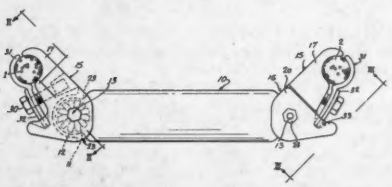


A magnetically compensated conductor pair for connecting a plurality of circuit elements in parallel. A pair of conductors each having a thickness which is small in relation to the length and width thereof are insulated from one another by a sheet of a nonconductive material disposed therebetween. The terminals of each circuit component are connected only to predetermined respective conductors, the connections of each pair of component terminals being located so as to establish a symmetrical terminal distribution about the points where the conductors are connected to an external circuit. As current flows into one component terminal through one conductor and out of the other component terminal through the other conductor, the current distribution established in one conductor is equal and opposite to that established in the other conductor, on a point-by-point basis, along substantially the entire length and width of both conductors. This results in a mutual cancellation in the magnetic flux produced by current in the conductor pair and, thereby, in a reduction in the self-inductance thereof.

3,609,209
SPACER DAMPER

Herbert James Houston, Oakville, Ontario; Robert Gordon Baird, Burlington, Ontario; Kenneth Dale Bolt, Burlington, Ontario, and Adolf Gretzinger, Ancaster, Ontario, all of Canada, assignors to N. Slater Company, Division of Slater Steel Industries Limited

Filed June 3, 1969, Ser. No. 830,002
Claims priority, application Canada, Apr. 9, 1969, 048,169
Int. Cl. H02g *7/12, 7/14*
U.S. Cl. 174—42 **11 Claims**

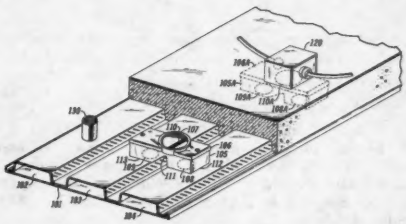


A cable damper for damping vibrations in two parallel electrical cables has a main body and two arms mounted thereon. The arms carry cable clamping means for holding the two cables and are mounted on the body by pivotal mountings which allow for pivotal movement of the arms only about predetermined axes parallel to the cables held by said arms. The pivotal mountings for the arms include resilient energy absorbing means biasing the arms into neutral positions in which positions the arms are inclined to the common plane of said cables. The inclinations are such that the range of angular movement of an arm about said neutral position such as can be caused by vibrations of a cable attached thereto lies between planes through the pivotal aXis of said arm respectively parallel to and perpendicular to said common plane.

3,609,210
MULTIPLE SERVICE FLOOR BOX

Kenneth Edwin Guritz, 570 Emerald Harbor Drive, Sarasota, Fla.

Filed June 26, 1970, Ser. No. 50,119
Int. Cl. H02g *3/08, 3/28*
U.S. Cl. 174—49 **8 Claims**



A floor service fitting for use with cellular steel floor building construction. The service fitting comprises a base member having two isolated compartments. The base member is proportioned to bridge between two cells of the cellular steel floor. The bottom of each compartment has a relatively large opening. Corresponding openings are placed in adjacent cells of the cellular steel floor and the base is secured with the openings in the two compartments directly above the openings in the adjacent cells. The base is securely anchored to the adjacent cells to provide a good mechanical and electrical connection. The two isolated compartments are separated by an integral divider which has an elongated slot along the length thereof for receiving a metal separator. The service fitting further comprises a cap member which is adapted to be physically and electrically secured to the base member and comprises a relatively large opening centered above the divider. The cap member and the base member in one instance are proportioned so that the upper surface of the cap member coincides with the upper surface of the concrete which is poured over the cellular floor. In another example, a separate adjustable member is adapted to engage the cap member and its upper surface coincides with the upper surface of the concrete.

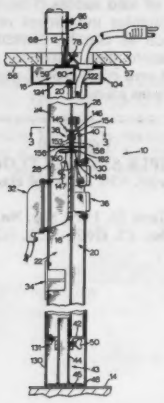
3,609,211
DUCT WITH POWER AND COMMUNICATIONS OUTLET

Adrian P. Van Herk, Thornhill, Ontario, Canada, assignor to Medland Enterprises, Toronto, Ontario, Canada

Filed Aug. 28, 1970, Ser. No. 67,924
Int. Cl. H02g *3/04*
U.S. Cl. 174—49 **10 Claims**

A service column for attachment to a suspended ceiling having inverted T-section girders to provide services at a work area. The column includes an upright main member attached by its upper end to a clamping bracket assembly which is adapted to be attached to the girders for longitudinal sliding movement on the girders. The clamping bracket

assembly includes a fastener for locking the assembly to the girder in any predetermined position. Covers on the main

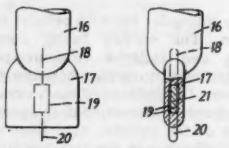


member house service outlets, and the column has an adjustable foot for locating the column on a floor.

3,609,212
SEALS FOR ELECTRICAL DEVICES

Frank Lewis, London, England, and John Willoughby Thomas Wright, deceased, late of Leicester, England (by Audry Mabel Wright and Denis Wilfred Clarke, legal executors), assignors to British Lighting Industries Limited, London, England

Filed July 1, 1969, Ser. No. 840,597
Claims priority, application Great Britain, July 1, 1968, 31,324/68
Int. Cl. H01j *5/38*
U.S. Cl. 174—50.62 **12 Claims**

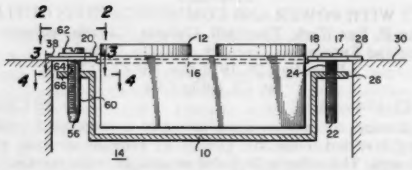


A pinched seal for envelopes of electrical devices having a plurality of lead-in conductors, in which a layer of material of lower softening point than the envelope is placed between foil portions of the lead-in conductors to form a sandwich so that during the formation of the pinched-seal the material between the foils flows as readily as the material outside the foils even though it is at a lower temperature.

3,609,213
AUTOMATIC GROUNDING FOR RECEPTACLE

Paul H. Winter, 303 Robineau Road, Syracuse, N.Y., and Paul W. Herzog, 127 Martin St., Syracuse, N.Y.

Filed Nov. 2, 1970, Ser. No. 86,047
Int. Cl. H05k *5/02*
U.S. Cl. 174—51 **6 Claims**

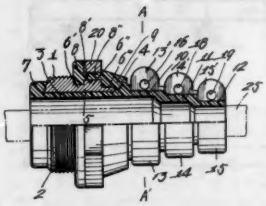


A slotted grounding strap is mounted across the spaced parallel legs of the end portion of a receptacle mounting strap and a screw is snugly and resistently carried in the slot. The screw is threadedly mounted in the mounting ear of a flush-type box to secure the receptacle in the box and provide an automatic low resistance electrical path between the mounting strap and the box.

3,609,214
CORD HOLDER

Tadao Totsuka, 9, 35, 2-Chome Johoku Hamamat-su, Shizuoka-ken, Japan

Filed Apr. 30, 1969, Ser. No. 820,503
Claims priority, application Japan, July 26, 1968, 43/63547
Int. Cl. H01r *13/58*
U.S. Cl. 174—65 R **10 Claims**

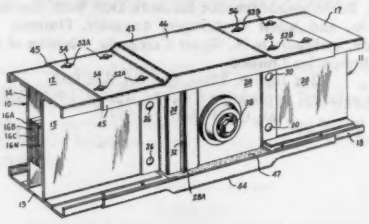


A cord holder having a rigid annular member adapted to be attached to the casing of an electric appliance and a deformable insulation hollow insulation member fitted in the annular member. The hollow member includes a plurality of sections having different diameters for receiving electric cords having different diameters and provided with integral tightening pieces surrounding the outer periphery of said sections and adapted to receive tightening bolts.

3,609,215
ELECTRIC POWER BUSWAY WITH THERMAL EXPANSION ABSORBING JOINTS

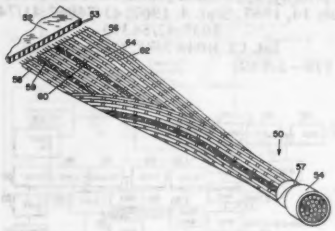
Walter Giger, Jr., Wethersfield; Robert A. Fulop, Torrington, and Robert L. McCrevey, Canton, all of Conn., assignors to General Electric Company

Filed May 7, 1969, Ser. No. 822,476
Int. Cl. H02g *15/08*
U.S. Cl. 174—88 B **25 Claims**



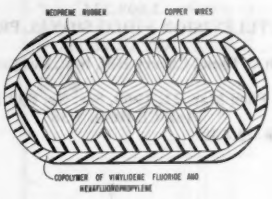
An electric power busway including joints having means allowing relative longitudinal movement of the bus bar sections and having generally planar bus bar contact surfaces, the contact surfaces being scored or grooved to provide lubricant reservoir spaces. Lubricant trapped in the reservoir spaces permits longitudinal movement of the bus bars with respect to each other occurring because of thermal expansion, without excessive wear of the contact surfaces and without harmful increase of electrical resistance and consequent excessive heating of the joint. The construction makes possible a busway system having a large number of busway sections, without use of special thermal expansion-absorbing sections as required by busway systems with prior art-type joints.

3,609,216
TWISTED CABLE
Albert R. Copp, Hudson, Mass., assignor to Surprenant, Inc., Jaffrey, N.H.
Filed June 26, 1970, Ser. No. 50,029
Int. Cl. H01b 7/00, 7/08
U.S. Cl. 174—113 R 5 Claims



A cable comprises a twisted flat cable and an outer retaining jacket. If a portion of the jacket is removed at the end of the cable, the cable can be readily flattened to facilitate connection procedures.

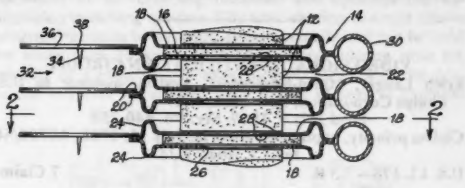
3,609,217
ELECTRIC SUPPLY CABLES FOR ELECTRIC FURNACES
Piero Gaja, Turin, Italy, assignor to Cear S.p.A, Turin, Italy
Filed Oct. 22, 1969, Ser. No. 868,486
Claims priority, application Italy, Oct. 23, 1968, 53592 A/68
Int. Cl. H01b 7/00
U.S. Cl. 174—120 2 Claims



Supply cables for electric furnaces, of the type in which a number of metal filaments are embedded in a neoprene casing, are protected against high heat and are made wear resistant, by forming on the neoprene sheath an outer sheathlike covering of a copolymer of vinylidene fluoride and hexafluoropropylene.

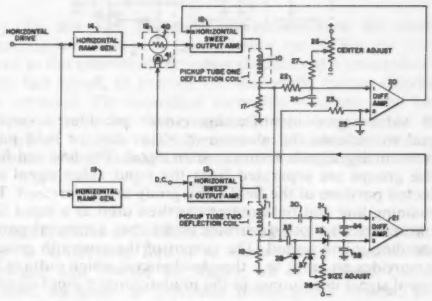
3,609,218
HIGH VOLTAGE ELECTRICAL INSULATORS WITH FLASHOVER CONTROL MEANS
Raymond G. Herb, Madison, and James A. Ferry, Middleton, both of Wis., assignors to National Electrostatics, Middleton, Wis.
Filed Nov. 3, 1969, Ser. No. 873,216
Int. Cl. H01b 17/48; H02n 1/00; H05h 7/00
U.S. Cl. 174—141 4 Claims

The disclosed insulator comprises a series of cylindrical insulating members with barrier cushions interspersed therebetween. Each barrier cushion comprises an insulating disk of greater diameter than the insulating members. Conductive disks are disposed between the insulating members and the insulating disks. Each barrier cushion comprises a pair of such conductive disks, having outer edge portions welded together along an annular joint. The barrier cushions prevent propagation of a spark along the length of the insulator. The conductive disks have laterally projecting convolutions of generally cylindrical curvature, forming spark gaps. The spacing between the adjacent convolutions represents



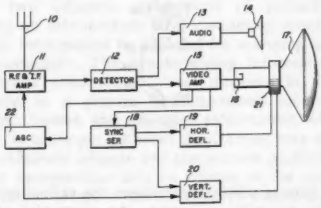
the least spacing between the electrically conductive disks of adjacent barrier cushions.

3,609,219
SYSTEM FOR REGULATION OF COLOR TELEVISION CAMERA SIZE AND CENTERING CURRENTS
Max H. Diehl, Manlius, N.Y., assignor to General Electric Company
Filed Jan. 22, 1970, Ser. No. 4,901
Int. Cl. H04n 5/44
U.S. Cl. 178—5.4 12 Claims



Long-term registration stability in multiple tube television color cameras is improved by minimizing differential changes in sweep size and centering. A comparison of the average and peak-to-peak amplitudes of current in the deflection coils of one tube to the average and peak-to-peak amplitudes of current in the deflection coils of the second tube in a two-tube color camera, or to the average and peak-to-peak amplitudes of current in the deflection coils of the second and third tubes in a three-tube color camera, is made, and DC error voltages for size and centering are derived and applied to the sweep circuitry in a manner to minimize drift.

3,609,220
VERTICAL SCAN CIRCUIT
Lawrence R. Poel, Elmhurst, Ill., assignor to Warwick Electronics Inc.
Filed June 3, 1969, Ser. No. 829,934
Int. Cl. H04n 5/04
U.S. Cl. 178—7.3 R 9 Claims



A vertical scan circuit for a television receiver in which a free-running oscillator is synchronized by the vertical

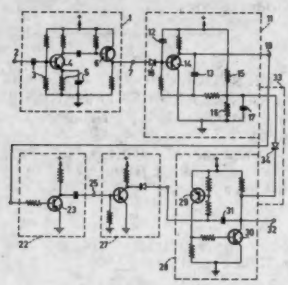
synchronizing component of the received signal. The free-running frequency of the vertical oscillator is varied in accordance with the amplitude of the received television signal.

3,609,221

VIDEO SIGNAL IDENTIFICATION CIRCUIT

Erich Langer, Maria-Enzersdorf, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 9, 1969, Ser. No. 840,250
Claims priority, application Austria, July 11, 1968, A6701/68
Int. Cl. H04n *1/38*
U.S. Cl. 178—7.3 R **7 Claims**



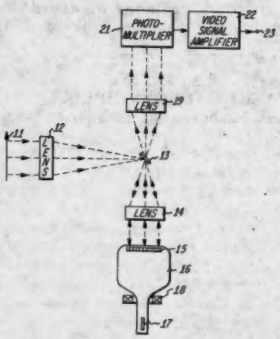
A video signal identification circuit provides a control signal to indicate the absence of either line or field pulse synchronizing signals within a video signal. The line and field pulse groups are separated from the input video signal and selected portions of the field pulse group are suppressed. The remaining line and field pulses are then used as a input to a monostable sawtooth generator which has a natural period exceeding a line period. The output of the sawtooth generator provides an input to a threshold circuit which outputs the control signal in response to the predetermined input signal.

3,609,222

ELECTRO-OPTICAL IMAGE FORMING SYSTEM

Walter Joseph Howarth, Trenton, N.J., assignor to RCA Corporation

Filed Apr. 13, 1970, Ser. No. 28,354
Int. Cl. H04n *5/38, 9/08;* **G03b** *21/00*
U.S. Cl. 178—5.4 BD **7 Claims**



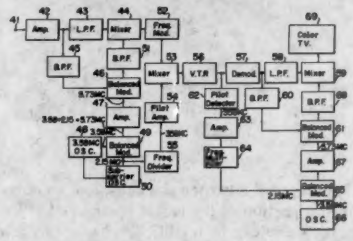
Light from a subject illuminates the reflecting member of electronic scanning apparatus the elemental areas of the reflecting member being selectively deformable by an unmodulated electron beam to direct reflected subject-derived light past a stop in a schlieren projection system and onto video signal-developing means.

3,609,223

VIDEO TAPE RECORDER DEVICE UTILIZING SINGLE MAGNETIC HEAD

Hisao Tajiri, Sagamihara-shi, and Shigeo Tanaka, Kawasaki-shi, both of Japan, assignors to Tokyo Shiboura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Nov. 7, 1967, Ser. No. 681,186
Claims priority, application Japan, Nov. 12, 1966, Nov. 14, 1966, July 14, 1967, Sept. 4, 1967, 41/74062;41/74418;42/45039;42/56373
Int. Cl. H04n *5/78;* **G11b** *5/04*
U.S. Cl. 178—5.4 CD **9 Claims**



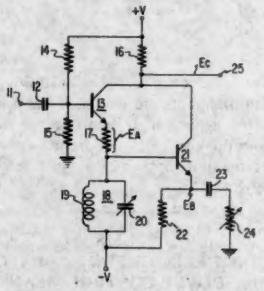
A video tape recorder device for use with color television signals including luminance and chrominance signal components which are to be recorded on a magnetic tape and reproduced therefrom, utilizing a pilot signal for obtaining color television signals free from phase variation, and utilizing a quasi-subcarrier wave for reducing the bandwidth of the color television signals to be recorded on the magnetic tape and reproduced therefrom relative to the bandwidth of the original color television signals.

3,609,224

COLOR TELEVISION VIDEO SIGNAL PROCESSING APPARATUS

John Joseph O'Toole, Cherry Hill, N.J., assignor to RCA Corporation

Filed Mar. 21, 1969, Ser. No. 809,107
Int. Cl. H04n *5/38*
U.S. Cl. 178—5.4 R **15 Claims**



Apparatus is provided for separating portions of color television video signals on a frequency selective basis. First and second frequency component signals are separated by a single resonant circuit and applied to separate processing stages. The processed component signals are recombined to form composite video signals.

3,609,225

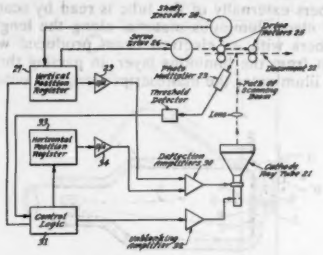
VARIABLE RATE FACSIMILE SYSTEM

Langdon B. Stallard, Flushing, N.Y., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 14, 1969, Ser. No. 866,286
Int. Cl. H04n *1/04, 3/22, 5/36*
U.S. Cl. 178—7.7 **6 Claims**

A variable rate facsimile system characterized by scanning and recording mechanisms which traverse a fixed raster pat-

tern but whose scanning and recording rates vary according to the information content of the graphic material. The data is compressed by a known run length coding technique to effect redundancy reduction. Scanning of the copy to be transmitted and reproduction of the copy at the recorder employ cathode-ray tube flying spot scanners whose spot deflection is controlled by horizontal and vertical digital counters each driving a digital/analog converter.



3,609,226

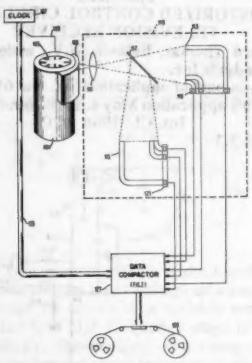
DATA COMPACTOR

Donald R. Thompson, Woodstock, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 11, 1969, Ser. No. 815,308

Int. Cl. H04n *1/40, 1/06, 7/12*

U.S. Cl. 178—6 **4 Claims**



A data encoder which compacts the data necessary for recording the lines on a document by scanning a set of contiguous regions of equal area. The data compactor examines first a region group of two regions in one direction. A second comparator then examines three of these outputs for two regions in a second perpendicular direction and produces an output dependent upon their content. Storage means then record the output of the second comparator.

3,609,227

RANDOM ACCESS AUDIO/VIDEO INFORMATION RETRIEVAL SYSTEM

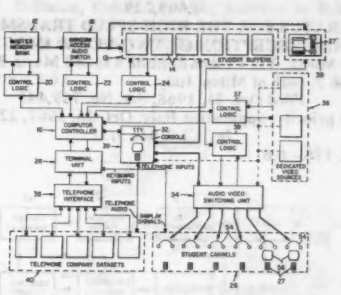
Maynard J. Kuljian, Palo Alto, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sept. 9, 1968, Ser. No. 758,559

Int. Cl. H04n *1/28;* **G09b** *5/06;* **G11b** *5/86*

U.S. Cl. 178—6.6 A **19 Claims**

A random access retrieval system particularly adaptable as an instructional resource center, wherein master recording mediums feed audio or audio/video information recorded thereon in the form of selected programs to individual recording mediums, at the request of an individual located at one of a plurality of information request positions. The programs are selected on a time-sharing basis utilizing control logic generally in the form of computer/controller means which integrates all system operations, e.g., commands the operation of all recording mediums and operates the audio/video switching systems. The time-sharing concept allows program requests to be made simultaneously and not be held for more than 30 seconds, with the total waiting time for transfer of a program not exceeding 60 seconds in the particular retrieval system described herein by way of example



only. To this end, programs are recorded on the master recording mediums at a selected slow speed, but are transferred to the individual recording mediums at a selected relatively fast speed, to provide the essentially instant information retrieval. The individual recording mediums may have an extra track for the responses or comments of the requestor. Various embodiments and modifications are available in accordance with the invention concepts.

3,609,228

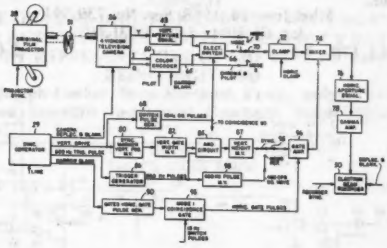
VIDEO FILM AND FILM-RECORDING APPARATUS

Peter C. Goldmark; Robert A. Castrignano; John M. Hollywood, and Donald W. Ridley, all of Fairfield County, Conn., assignors to Columbia Broadcasting System, Inc., New York, N.Y.

Filed Nov. 15, 1968, Ser. No. 776,137

Int. Cl. H04n *5/86*

U.S. Cl. 178—6.7 **19 Claims**



Electronic system for producing a motion picture record containing two adjacent successions of picture frames separated by an intermediate strip containing synchronizing or reference information to be used by scanning apparatus during reproduciotn. The synchronizing information comprises a narrow window-type mark disposed in the intermediate strip in a precise predetermined location with respect to the frames, and reference information, which can also appear in a margin adjacent the frames, may comprise alternating relatively opaque and transparent portions. Additionally, the intermediate strip or margin of the record adjacent the frames of one of the successions contains a record of reference carrier waveform in the event that those frames carry a representation of color information in the form of modulation of a carrier.

The system includes means for generating a signal at a predetermined time following the initiation of each vertical

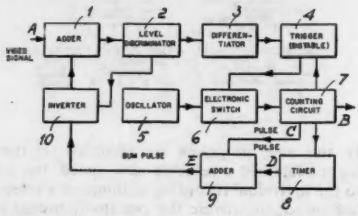
scanning sequence of the video source and a second signal in predetermined time relation to the horizontal scanning rate of the video source. Upon time coincidence of the generated signals, an output signal is mixed with the video signal and fed to the modulating input of a recording beam used in making the record. This results in recorded synchronizing or reference indicia in the intermediate strip or margin of the record medium.

3,609,229

APPARATUS FOR THE HIGH-SPEED TRANSMISSION AND RECEPTION OF TWO-LEVEL IMAGES

Virgilio Mosca, Via Cesare Batteste 11, and Maria Bonfa, Via Orazio 7, both of Milan, Italy

Filed Oct. 21, 1968, Ser. No. 769,445
Claims priority, application Italy, Oct. 26, 1967, 22019A/67
Int. Cl. H04n *3/32*
U.S. Cl. 178—6.8 **2 Claims**



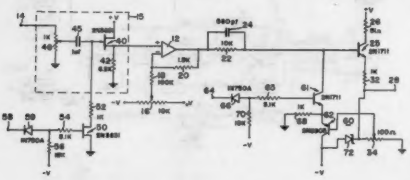
This disclosure relates to an apparatus for the high-speed transmission and reception of two-level images in which a video signal is transmitted to a receiver and scanned in order to detect the presence of level transitions, the scanning point being stopped upon detection of a level transition for the time necessary to send an impulse to the receiver and then caused to continue its motion at high speed.

3,609,230

BROADBAND VIDEO PROCESSOR WITH VERY HIGH INPUT IMPEDANCE

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and James W. Wood, 197 S. Park Victoria Drive, Milpitas, Calif.

Filed June 24, 1968, Ser. No. 739,391
Int. Cl. H04n *5/16;* **H03f** *3/16*
U.S. Cl. 178—7.1 **2 Claims**



A broadband video processor is disclosed. It includes a very-high-input impedance stage which incorporates a field effect transistor. The processor is relatively immune to ambient noise. Also, the high impedance enables the use of a small input capacitor which accounts for fast DC restoring.

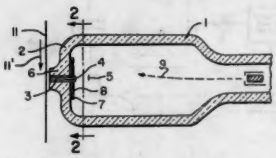
3,609,231

ELECTRON TUBE MANUSCRIPT READER

Kazuyoshi Nagao, Yokohama, and Reiji Hirano, Tokyo, both of Japan, assignors to American Optical Corporation, Southbridge, Mass.

Filed Sept. 29, 1969, Ser. No. 861,855
Int. Cl. H04n *1/00*
U.S. Cl. 178—7.2 **4 Claims**

A cathode-ray tube for electro-optically reading a moving manuscript. The tube includes a long and thin strip of juxtaposed light-conducting fibers extending through its face with corresponding opposite ends of the fibers disposed internally and externally of the tube envelope. Internal ends of the fibers are coated with a light sensitive electron-emissive material which is surrounded by a layer of electroluminous material. A manuscript moved across the strip of light-conducting fibers externally of the tube is read by scanning the coating of electroluminous material along the length of the strip of fibers with an electron beam produced within the tube. Light from the luminous layer, in passing through the tube face, illuminates the manuscript along the outer face of



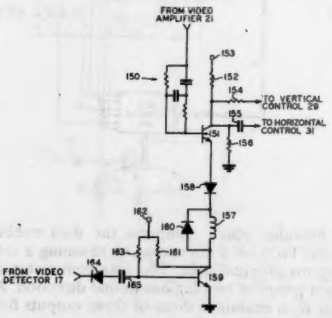
the strip of light-conducting fibers and light reflected from the manuscript in amounts characterized by the subject matter to be read therefrom is transmitted back into the tube by the strip of light-conducting fibers. The light sensitive electron-emissive material at the innermost ends of the fibers emits a pattern of electrons corresponding to the pattern of intensities of light received thereby. These electrons are collected by a target within the tube and produce an electrical charge in the target which may be used as an electrical reading signal per se or converted into other forms of reading information.

3,609,232

TRANSISTORIZED CONTROL CIRCUITRY FOR TELEVISION RECEIVER

Joseph Edward Thomas, Batavia, N.Y., assignor to Sylvania Electric Products Inc.

Continuation-in-part of application Ser. No. 690,146, Dec. 13, 1967. This application May 4, 1970, Ser. No. 34,482
Int. Cl. H04n *5/10*
U.S. Cl. 178—7.3 **10 Claims**



Transistorized automatic gain control and sync separator circuitry which increases the input impedance of the sync separator at high frequencies, such as random noise condition, and prevents loss of sync under conditions of high random noise level. The increased sync separator impedance at high frequency noise level is accomplished without any high frequency loading of the video amplifier from which the sync separator signal is obtained.

3,609,233

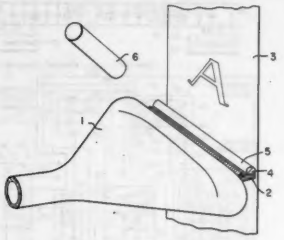
ELECTRON TUBE FACSIMILE APPARATUS

Kazuyoshi Nagao, Yokohama, Japan, assignor to American Optical Corporation, Southbridge, Mass.

Filed Sept. 29, 1969, Ser. No. 861,848
Int. Cl. H04n *1/00*
U.S. Cl. 178—7.2 **5 Claims**

A cathode-ray tube is provided with a light-transmitting face comprised of a rectangular strip of optical fibers having

a long and narrow light-emitting end across which a manuscript is moved for photoelectrically copying subject matter thereon. A flying spot of light produced within the tube is transmitted through the strip of fibers onto the manuscript and portions of this light reflected from the manuscript are



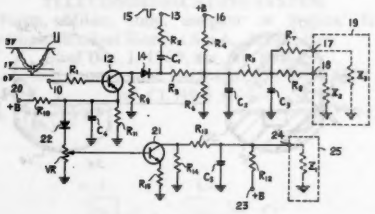
received by a prism-lens system adjacent the emitting end of the strip of fibers. This system then directs the reflected light onto a photoelectric transducer for conversion into an electrical signal which is useful as an electrical reading of the manuscript or convertible into other forms of facsimile information.

3,609,234

DELAYED AGC CIRCUIT

Atsumi Hirata, Tokyo, Japan, assignor to Victor Company of Japan Limited, Yokohama, Japan

Filed Apr. 8, 1969, Ser. No. 814,417
Claims priority, application Japan, Apr. 8, 1968, 43/27685
Int. Cl. H04n *5/52*
U.S. Cl. 178—7.3 DC **4 Claims**



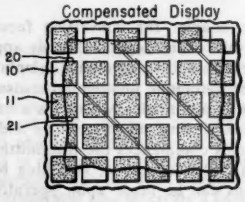
An automatic gain control circuit is disclosed, the circuit being capable of varying an input voltage of a circuit amplifying an AGC voltage by means of a variable resistor, which voltage is to be fed to a high frequency stage of a television receiver. Accordingly, the location of a rising point where the AGC voltage makes a distinct increase on an input-signal intensity AGC voltage characteristic is likewise varied.

3,609,235

MASK COMPENSATION FOR MATRIXED-ELEMENT FLAT-PANEL TELEVISION DISPLAY

Samuel P. Sawyer, Evanston, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Oct. 16, 1969, Ser. No. 866,978
Int. Cl. H04n *5/72;* **H01j** *5/16, 61/40;* **H01k** *1/26*
U.S. Cl. 178—7.85 **3 Claims**



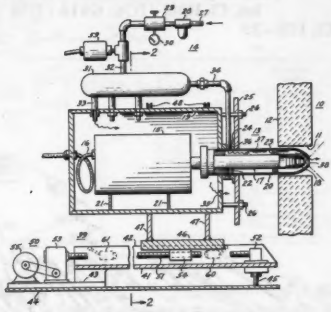
A flat-panel television display of matrixed emitting, controlling or reflecting image elements which differ in light output per unit excitation is compensated by a mask having transmitting areas of a size and configuration corresponding to those of the image elements which vary inversely in transmissivity from area to area with the brightness of each corresponding display element.

3,609,236

APPARATUS FOR TELEVISING THE INTERIOR OF HAZARDOUS CHAMBER

Wesley H. Heilman, Baltimore, Md., assignor to Bethlehem Steel Corporation

Filed Sept. 30, 1968, Ser. No. 763,678
Int. Cl. H01j *29/89*
U.S. Cl. 178—7.92 **8 Claims**



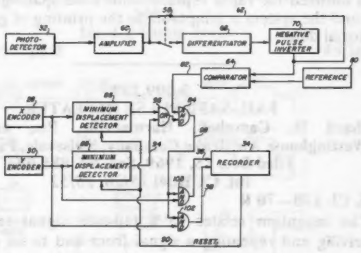
A cooled and purged television camera and lens assembly is mounted on a powered operator adjacent an apertured hazardous chamber. The powered operator is adapted to extend and retract the lens into and out of the aperture. Control means acts on the operator to cause automatic retraction of the lens upon loss of the cooling and purging media. Provisions are made for limiting lens movement by the powered operator.

3,609,237

LINE OR EDGE DIGITIZING SYSTEM WITH MEANS FOR AUTOMATICALLY OUTPUTTING ONLY DATA TRULY REPRESENTATIVE OF THE LINE OR EDGE BEING DIGITIZED

Heinz Joseph Gerber, West Hartford, Conn., assignor to The Gerber Scientific Instrument Company, South Windsor, Conn.

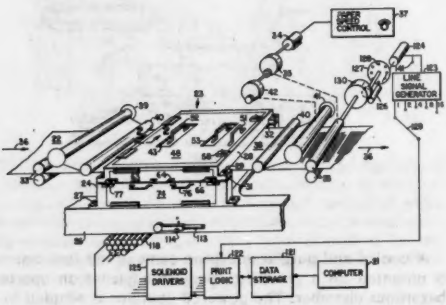
Filed Jan. 27, 1969, Ser. No. 793,974
Int. Cl. G08c *21/00*
U.S. Cl. 178—18 **10 Claims**



A digitizer for providing digital information defining the coordinates of points located along a line or edge of a map, drawing, template or other similar artwork includes a reticle manually movable along the line or edge and an associated

set of optical and electronic components for automatically outputting coordinate information only when the reticle is properly positioned over the line or edge being digitized. Two modes of operation are possible—one in which the signal to output coordinate information is produced by the crossing of the line being digitized, and another in which the output of coordinate information is enabled only after a certain increment has been traversed by the reticle in either the X or Y axis from the point at which information was previously outputted.

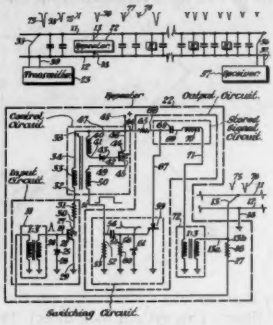
3,609,238
HIGH-SPEED DATA PRINTOUT
Carl F. Hodel, Berkeley, Calif., assignor to DHM Research & Development Corporation, San Francisco, Calif.
Filed Aug. 16, 1968, Ser. No. 753,114
Int. Cl. H04l *17/30*; **G01d** *15/16*
U.S. Cl. 178—25 **25 Claims**



Signals identifying alphanumeric characters for a plurality of lines of printing are temporarily stored in a memory while recording paper moves through a printing station having a plurality of rows of character-imprinting elements. Each row is comprised of identical character-imprinting elements and the number of rows is at least equal to the number of distinct characters which may be printed. A control system repetitively examines the memory to detect momentary coincidences between positions on the moving paper and any imprinting elements of any row which correspond to a character to be imprinted at those positions. The control system activates the appropriate imprinting elements as such coincidences occur to effect a very fast multiline form of printout. The rows of imprinting elements are defined on a flat stationary unitized member which may readily be removed and replaced and in which individual rows may be replaced as a unit and the associated actuating elements are also unitized for rapid replacement. Line spacing is adjustable and the system is adaptable to the printing of graphical or pictorial data.

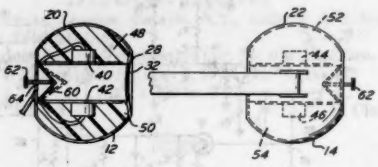
3,609,239
FAIL-SAFE PULSE REPEATER
Richard D. Campbell, Harmarville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.
Filed Dec. 15, 1969, Ser. No. 885,084
Int. Cl. H04l *25/20, 25/52*
U.S. Cl. 178—70 R **10 Claims**

The invention relates to a fail-safe signal repeater for receiving and repeating a signal from and to an electrically continuous rail. The signal repeater includes an input circuit electrically coupled to the electrically continuous rail to receive the signals to be repeated. A signal-repeating output circuit is electrically coupled to the rail to provide the repeated signal. Finally there is a control circuit which is electrically coupled respectively to the input circuit and the signal-repeating output circuit to thereby initiate the repeated signal while simultaneously providing a period of non-



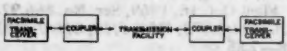
response for the repeater for a predetermined period of time after the signal to be repeated is received and repeated.

3,609,240
STEREOPHONIC HEADPHONES
Jon S. Fixler, Philadelphia, Pa., assignor to Industrial Patent Development Corp., Philadelphia, Pa.
Filed Mar. 18, 1970, Ser. No. 20,680
Int. Cl. H04r *1/10*
U.S. Cl. 179—1 G **7 Claims**



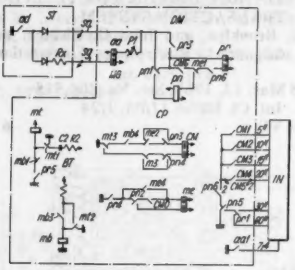
Stereophonic headphones mount pairs of audio transducers (speakers) on an opposing front to back axis relative to the head of a listener to create a greater panorama of sound.

3,609,241
ELECTRONIC COUPLER CIRCUIT
Alton F. Riethmeier, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed June 8, 1967, Ser. No. 644,682
Int. Cl. H04m *11/06*
U.S. Cl. 179—4 **8 Claims**



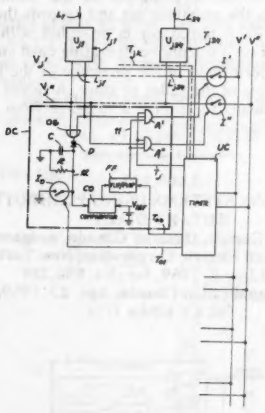
An electronic coupler for converting facsimile graphic communication information signals directly applicable to be transmitted over direct distance dialing telephone lines, and vice versa. In the automatic unattended transmit or receive modes, the coupler automatically answers a call made over the direct distance dialing telephone lines and after proper handshaking signals commences the transmitting or printing operation. In the attended mode, switching to transmit or receive provisions can be made upon operator decision of document transmission during a normal telephone conversation with equipment coupled to the coupler and the telephone lines.

3,609,242
AWAITING CALL INDICATOR SYSTEM
Francois Le Prince, Sainte-Genevieve-des-Bois, and Andre Boury, Paris, both of France, assignors to International Standard Electric Corporation, New York, N.Y.
Filed July 28, 1969, Ser. No. 845,213
Claims priority, application France, Aug. 1, 1968, 161,443
Int. Cl. H04m *3/36*
U.S. Cl. 179—8 A 3 Claims



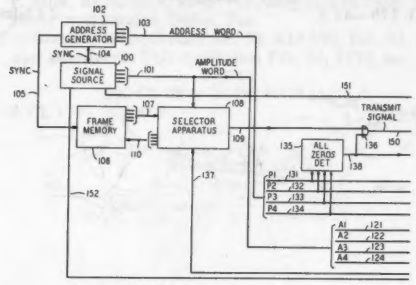
Awaiting call indicator system is associated with PABX operators' desks. It enables measuring the duration of public network incoming lines congestions and makes it possible to estimate at any moment the number of awaiting calls. It displays the measurements made with the help of a luminous indicator, this latter to be so-called "call-awaiting thermometer."

3,609,243
PROTECTIVE CIRCUITRY FOR TELECOMMUNICATION SYSTEM
Aldo Perna, Milan, Italy, assignor to Societa' Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy
Filed Dec. 1, 1969, Ser. No. 881,153
Claims priority, application Italy, Dec. 4, 1968, 24570 A/68
Int. Cl. H04j *3/14*
U.S. Cl. 179—15 BF 7 Claims



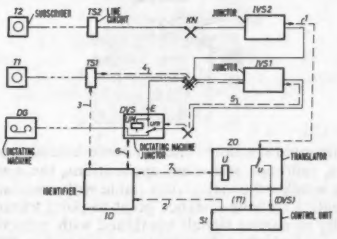
In a time-allocation telephone system with 96 local lines served by a common switching channel via four two-wire branch channels each allotted to a respective group of 24 lines, an integrating network counts the number of phases in a 100-phase clock cycle during which either wire of a particular branch channel is energized. If the number of unit charges stored in the integrating network during a cycle exceeds the maximum number (48) possible during normal operation, a comparator also receiving a fixed reference voltage trips a flip-flop to inhibit the transmission of switching signals to the main channel from the branch channel in the following cycle. At the beginning of each new cycle, the flip-flop is reset with immediately following discharge of the integrating network.

3,609,244
CONDITIONAL REPLENISHMENT VIDEO SYSTEM WITH VARIABLE LENGTH ADDRESS CODE
Frank W. Mounts, Colts Neck, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.
Filed Dec. 18, 1969, Ser. No. 886,324
Int. Cl. H04b *1/66*
U.S. Cl. 179—15.55 R 16 Claims



The amplitude of a sample from a signal having frame-to-frame redundancy is transmitted only if the amplitude differs significantly from the amplitude of a corresponding sample having the same time position in a previous frame interval. An address word is assigned to each sample to indicate the position of that sample within a group of samples. Group synchronization is maintained between the transmitter and receiver by forcibly transmitting the last sample in each group whether or not that sample represents a significant change. The value of each address word indicates the length of the interval between the location of its respective sample and the end of the group. Only those bits of an address word which are necessary to locate the sample in the interval between the last-transmitted sample and the end of the group are transmitted to the receiving location. A control word whose bit values indicate which bits of the next address word must be transmitted is developed from each address word and is stored until the next selected address word in response to an indication that its corresponding address word has been selected for transmission.

3,609,245
ARRANGEMENT FOR ENABLING AN EXISTING CALL TO BE TEMPORARILY INTERRUPTED
Kurt Richter, Stuttgart-Rot, and Horst Woller, Korntal, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.
Filed May 14, 1969, Ser. No. 824,445
Claims priority, application Germany, May 21, 1968, P 17 62 299.0
Int. Cl. H04m *3/42*
U.S. Cl. 179—18 B 4 Claims



The circuit enables an existing call to be interrupted without being cancelled. This is of particular significance for

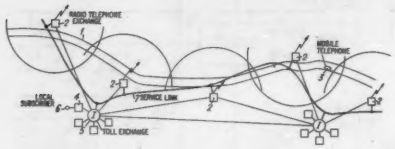
subscribers connected via their telephone sets to a dictating machine or a teaching machine for some length of time. According to another aspect the same interruption facilities are provided for interrupting a call to another subscriber after the call has lasted a predetermined, minimum time.

3,609,246

RADIOTELEPHONE COMMUNICATION SYSTEM

Jean Jacques Muller, Garches; Andre Jean Henquet, Boulogne/Seine, and Pierre Maurice Commegrain, Montrouge, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 30, 1968, Ser. No. 725,424
Claims priority, application France, May 5, 1967, 105 371
Int. Cl. H04q *7/00*
U.S. Cl. 179—41 A **7 Claims**



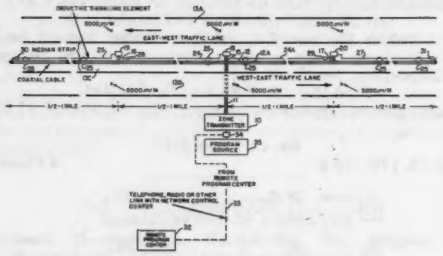
This system provides for automatic communications between the subscribers of public telephone networks and mobile sets over a large land area (or along a highway) covered by a plurality of radiotelephone exchanges. A call from a network exchange for a mobile is first transmitted to all these radio exchanges by a service-bus line. When one of the radio exchanges reaches the mobile in its area, it signals itself to the calling exchange and only then the calling exchange proceeds with the extension of the telephone toll connection to that radio exchange.

3,609,247

INDUCTIVE CARRIER COMMUNICATION SYSTEMS

William S. Halstead, New York, N.Y., assignor to Carrier Communication, Inc., New York, N.Y.

Filed Apr. 21, 1967, Ser. No. 632,699
Int. Cl. H04b *5/00, 5/02*
U.S. Cl. 179—82 **3 Claims**



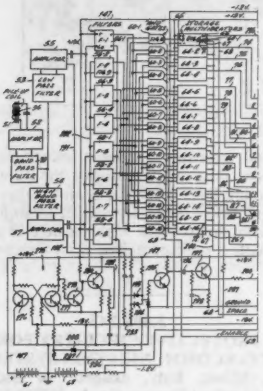
An integrated multiple-function communication system for highways, railroads and other applications, the system comprising a wideband coaxial trunk cable with associated amplifier/repeaters for long-distance point-to-point transmission of a plurality of carrier signals combined with inductive-signaling means including frequency converter/amplifiers each having an input physically coupled to the coaxial trunk cable and an output coupled to an inductive-signaling conductor, the latter disposed within the trunk-cable structure or electrically related thereto whereby a relatively uniform electromagnetic field of a desired strength is established along a highway or other service zone for inductive carrier communication with vehicles, roadside call boxes and other devices located in proximity to the cable which interconnects with a control or terminal point.

3,609,248

PRINT OUT CONTROL CIRCUIT FOR TELEPHONE TRANSACTION SYSTEM

Arnold M. Wolf, Brooklyn, and John G. Richter, Yonkers, both of N.Y., assignors to Electrospace Corporation, Glen Cove, N.Y.

Filed Mar. 12, 1969, Ser. No. 806,515
Int. Cl. H04m *11/06, 1/24*
U.S. Cl. 179—84 VF **6 Claims**



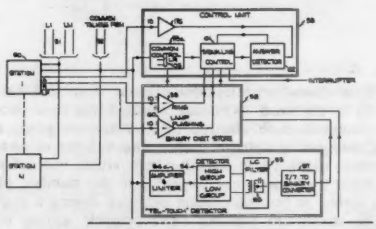
A system is described for buying materials or services by transferring funds in a bank from the buyer's deposit account to the seller's account. The transfer of funds is accomplished by means of a "touch-tone" telephone receiving set equipped with a printing means. A computer at the bank receives digital orders from the receiving set and records the transfer at that location. Each purchaser is provided with a secret purchaser number on a telephone operating card and the entire operation is performed in the presence of the purchaser and a representative of the seller or store. A ticket is carried by the printing means to receive a message from the bank representing the transaction.

3,609,249

KEY TELEPHONE SYSTEMS USING PUSHBUTTON OR ROTARY DIALS

Edouard Pinede, Gueiph, Ontario, Canada, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 9, 1969, Ser. No. 840,289
Claims priority, application Canada, Apr. 23, 1969, 049,568
Int. Cl. H04m *1/50*
U.S. Cl. 179—99 **10 Claims**



A key telephone system is made for operation with either pushbutton or rotary dial equipment. Initially, digital signals

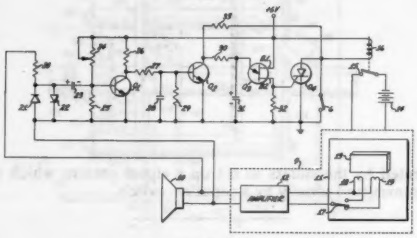
are sent to one of two receivers which responds exclusively to pushbutton or rotary dials, respectively. These two receivers are connected to a common control circuit which supervises ringing and provides answer supervision to operate the key system, per se.

3,609,250

APPARATUS FOR DELIVERING AN AUDIBLE MESSAGE FROM A VENDING MACHINE IN RESPONSE TO AN OPERATOR ACTIVATION

Robert E. Morris, Phoenix, Ariz., assignor to Houston G. Smith, a part interest

Filed Nov. 7, 1969, Ser. No. 874,917
Int. Cl. G11b *15/18*
U.S. Cl. 179—100.1 C **2 Claims**



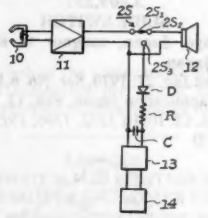
In order to deliver an advertising message to a vending machine user prior to his selection of a particular vended item, apparatus is provided responsive to the deposit of coins in the vending machine to institute playback of a prerecorded message through endless tape cartridge playback apparatus under the control of a timing circuit. The timing circuit is adapted to respond to the end of the message for turning off the playback apparatus until it is activated again by the next deposit of coins. In a variant configuration, the message playback is instituted by pressing a button incorporated into a display of merchandise.

3,609,251

PROGRAM-SELECTING MEANS FOR ENDLESS MAGNETIC TAPE REPRODUCING APPARATUS

Itsuki Ban, No. 829, Higashi-Oizumi-machi, Nerima-ku, Tokyo, Japan

Filed Oct. 3, 1968, Ser. No. 764,862
Claims priority, application Japan, Oct. 3, 1967, Oct. 3, 1967, 42/63288;42/63289
Int. Cl. G11b *15/44*
U.S. Cl. 179—100.2 **8 Claims**



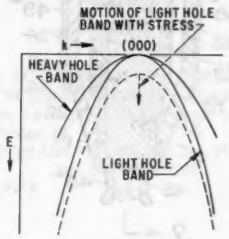
Program-selecting system for an endless magnetic tape reproducing apparatus wherein a particular program recorded on the tape can be selected automatically for almost immediate playback independent of its position thereon. By using a sensing circuit to generate an output signal every time an unrecorded area between programs is detected, by comprising in a comparison circuit the number of generated outputs with a preselected number corresponding to the sequential location of the desired program upon the tape and by having an output generated every time a comparison is achieved, the output causing the tape feed to switch from a fast rate of feed to a governed rate of feed, a program-selecting system is created that provides for the automatic playback of a particular program recorded on an endless magnetic tape.

3,609,252

TRANSDUCER APPARATUS AND SYSTEM UTILIZING INSULATED GATE SEMICONDUCTOR FIELD EFFECT DEVICES

Max E. Broce, McKinney; Derek Coleman, Dallas, and Jack P. Mize, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application Ser. No. 610,991, Jan. 23, 1967, now abandoned. This application Feb. 24, 1970, Ser. No. 14,744
Int. Cl. H04r *23/00*; **H01l** *11/14*
U.S. Cl. 179—100.41T **11 Claims**



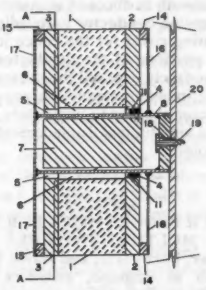
A transducer apparatus wherein the source to drain conductance of an insulated gate semiconductor field effect device is modulated by the application of mechanical stress to the channel layer of the device. Specific transducer modifications include microphone pickups and phonopickups. The pickup may include preamplifiers in either discrete or integrated circuit form.

3,609,253

LOUDSPEAKER WITH IMPROVED VOICE COIL SUSPENSION

William J. Ashworth, Route 2, New Albany, Miss.

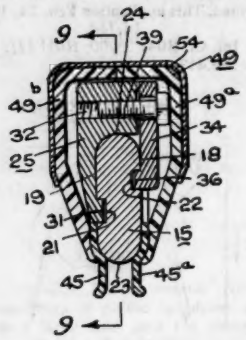
Filed May 3, 1968, Ser. No. 726,434
Int. Cl. H04r *9/04*
U.S. Cl. 179—115.5 R **4 Claims**



A loudspeaker driver having its voice coil wound on a movable bobbin that is flexibly supported at both of its ends,

with the bobbin resiliently suspended in such a manner where only an in-and-out movement is permitted.

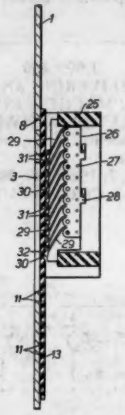
3,609,254
CURRENT CONDUCTOR SPLICE JOINT
Roland M. Caldwell, Lynchburg, Va., assignor to H. K. Porter Company, Inc., Lynchburg, Va.
Filed Dec. 12, 1969, Ser. No. 884,626
Int. Cl. B60m *1/24*
U.S. Cl. 191—44.1 **3 Claims**



Proximate end portions of a pair of electrical conductors of generally S-shaped configuration in transverse cross section are jointed in longitudinally aligned end-to-end relation by a connector providing good mechanical and electrical connection between the coupled conductors. The conductors are fitted with U-shaped insulating sheaths which extend along the full length of each conductor and have laterally spaced depending flanges or lips extending freely beyond one longitudinal edge of the conductor. These sheaths, in the regions of the interconnected end portions of the conductors, are cut away to accommodate the above-mentioned connector without, however, destroying the integrity of their channel-forming flanges or lips so that when the conductors are joined together the ends of the sheaths abut one another at the center of the joint and thereby provide the guide channel with continuous smooth surfaces of uninterrupted run of current collector from one conductor to its adjoining conductor. A two-part insulating cover for the splice joint extends over the abutting end portions of the conductor sheaths in such manner as to leave freely exposed the current collector guide channel. Coacting indexing means are provided in the joint cover and conductor sheaths to accurately secure the cover in position against longitudinal displacement thereof relatively to the spliced joint.

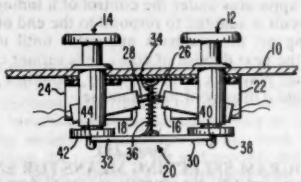
3,609,255
SLIDING SWITCH PROGRAMMER FOR CONTROLLING MULTIPLE SWITCHES
John Covell Collier, Farnworth, and David William Rickards, Stanmore, both of England, assignors to AMP Incorporated, Harrisburg, Pa.
Filed Sept. 25, 1969, Ser. No. 860,930
Claims priority, application Great Britain, Sept. 27, 1968, 45877/68
Int. Cl. H01h *9/00*
U.S. Cl. 200—1 R **5 Claims**

A programming unit designed as a variable input unit for a data transmission system incorporates a number of sliders which are able to be moved to various positions to set up a program. A switch matrix situated behind the sliders is



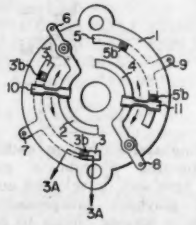
operated by the sliders to set up a signal pattern which can be transmitted serially by a separate switch.

3,609,256
DUAL SWITCHING DEVICE
Hilliard R. Di Veto, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed June 15, 1970, Ser. No. 45,998
Int. Cl. H01h *9/26*
U.S. Cl. 200—5 E **8 Claims**



A dual switching device is provided with a pair of switches individually actuatable by a tripedal actuating level rockable about either one of a pair of plungers by the other, each switch being actuated mutually exclusive of the other by a respective plunger, neither switch being actuated by both plungers operating in mutual conjunction.

3,609,257
SLIDE SWITCH
Sei Jinsenji, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Jan. 27, 1970, Ser. No. 6,165
Claims priority, application Japan, Feb. 12, 1969, 44/12112
Int. Cl. H01h *1/02, 1/06, 19/58*
U.S. Cl. 200—11 D **4 Claims**



A slide switch in which either of fixed or movable contact elements have electrically high resistance portions formed at

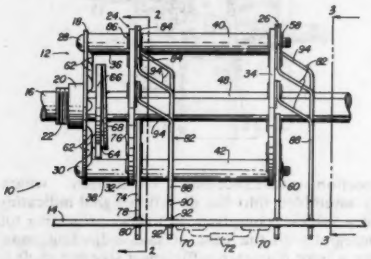
portions where fixed and movable contact elements start to contact with each other and at portions where fixed and movable contact elements start to move away from each other.

3,609,258

ELECTRIC SWITCH AND PRINTED CIRCUIT BOARD CONSTRUCTION WITH IMPROVED TERMINAL CONNECTION MEANS

Gerald H. Leland, Dayton, Ohio, assignor to Ledex, Inc., Dayton, Ohio

Filed Sept. 29, 1969, Ser. No. 861,579
Int. Cl. H01h *19/58, 9/02*
U.S. Cl. 200—11 D **11 Claims**



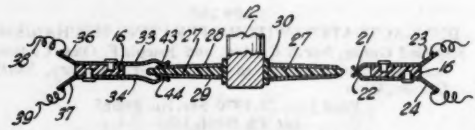
Two sets of printed circuit terminal lugs are used with a wafer switch. The terminal lugs connected to the wafer switch at points closest to the printed circuit board have a generally planar configuration. Each of the other lugs has an intermediate portion projecting away from the wafer switch whereby all of the possible switch positions on the wafer switch can be connected by a terminal lug to a printed circuit board without electrical contact between the lugs or other switch parts.

3,609,259

ELECTRICAL WAFER SWITCH ASSEMBLY WITH IMPROVED ROTOR CONTACT STRUCTURE

Kalman Drebin, Brooklyn, N.Y., assignor to I Jordan Kunik, New York, N.Y., a part interest

Filed Oct. 30, 1969, Ser. No. 872,504
Int. Cl. H01h *1/22, 19/58*
U.S. Cl. 200—11 D **10 Claims**



An electrical switch of the rotary wafer type which permits interruptions and measuring the circuit conditions in any selected one of a plurality of continuously running circuits.

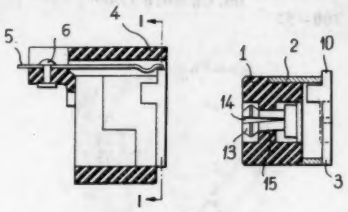
3,609,260

CYLINDRICAL SWITCH FOR IGNITION AND STARTING OF ENGINES AND OTHER USES

Paul Lipschultz, Croissy-sur-Seine, France, assignor to Societe D'Exploitation Des Brevets Neiman S. A., Neuilly-sur-Seine, (Hauts de Seine), France

Filed June 23, 1969, Ser. No. 835,377
Claims priority, application France, July 15, 1968, 159209
Int. Cl. H01h *27/06*
U.S. Cl. 200—44 **5 Claims**

This arrangement relates to a locking device such as a cylindrical switch for ignition and starting of an engine and other like uses. The switch has an insulated, hollow cylindrical stator with a plurality of contact blades mounted on the inner surface parallel with the cylinder axis and connected to ignition and starting means and other accessories. A rotor is positioned in the hollow stator and comprises an insulated cylinder carrying a conductive plate having a shape formed in steps to ensure contact with the blades. An insulated driving element, controlled by the locking device, is assembled by resilient fitting means to the rotor. A cam on the driving element engages with the blades to selectively break the connections.

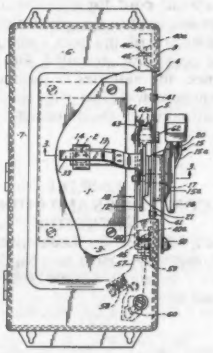


3,609,261

EXTERNAL ACTUATOR HANDLE MECHANISM FOR ENCLOSED CIRCUIT BREAKERS

Tadeusz J. Rys, Lexington, Ky., assignor to Square D Company, Park Ridge, Ill.

Filed May 15, 1970, Ser. No. 37,521
Int. Cl. H01h *9/20*
U.S. Cl. 200—50 A **5 Claims**



An exterior operating handle is mounted on the wall of the enclosure of an enclosed-type circuit breaker and is drivingly connected to the operating handle of the circuit breaker. The cover is normally latched in closed position by a manually operable latch.

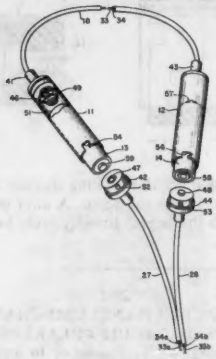
Interlock means normally interlock the exterior handle, cover, and enclosure wall in a manner such that (a) when the cover is latched closed, the exterior handle can be operated to open and close the circuit breaker contacts, selectively; (b) when the cover is unlatched and the exterior handle in in ON position, the interlock means becomes operative to prevent opening of the cover; and (c) when the cover is unlatched or open and the exterior handle is in OFF position, the interlock becomes operative to prevent moving the exterior handle to ON position.

If the contacts of the circuit breaker become welded together in closed position while the exterior handle is in ON position, and the exterior handle is moved manually to OFF position and the cover is then unlatched, the interlock means, which normally prevent moving the handle to ON position while the cover is unlatched, are defeated for an instant so as to permit the exterior handle to return automatically to ON position, thus preventing a false indication, and then become active again to interlock the cover and enclosure with the exterior handle in ON position.

3,609,262
NECK-CARRIED BATTERY PACK

John E. Hotchkiss, Corte Madera, Calif., assignor to Hotchkiss Instruments, Inc.

Continuation-in-part of application Ser. No. 755,661, Aug. 27, 1968. This application May 13, 1969, Ser. No. 824,215
Int. Cl. H01h *35/00*
U.S. Cl. 200—52 8 Claims

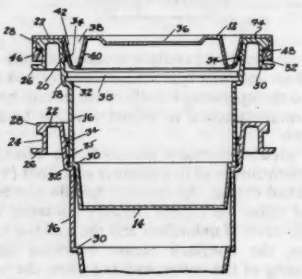


A lightweight battery pack adapted to be worn around a user's neck for detachable connection to and powering of a portable electric instrument and being characterized by a pair of battery receptacles secured together in spaced relation by an electrical cord for placement around the user's neck to support the battery receptacles on laterally opposite sides thereof forward of the user's shoulders. The battery receptacles are preferably provided with electrical contacts formed to connect the batteries to produce an electrical circuit in which current will flow with predetermined polarity only upon positioning of the batteries in a predetermined relative orientation.

3,609,263
PLASTIC CONTAINERS AND COVER CLOSURES THEREFOR

Sandro Clementi, 928 West St., Leominster, Mass.

Filed May 6, 1970, Ser. No. 35,032
Int. Cl. B65d *43/10*
U.S. Cl. 220—60 R 6 Claims

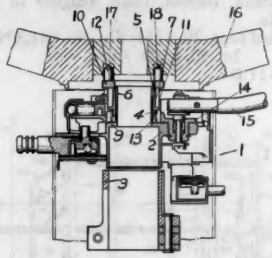


A resilient plastic container and a cover therefor with interlocking engagement at the periphery of the cover and the container, wherein the edge of the container is in an inverted U-form having an outer member with a terminal outstanding rim and an abutment in spaced relation; said cover including a U-shaped trough having an outer member terminating in a flat flange extending outwardly with a downturned extension having a rearwardly facing projection for snapping in under the abutment on the container in closed position of the cover therewith; and an interiorly directed bead on the container for frictional engagement with the outer element of said U-shaped channel at the periphery of the cover.

3,609,264
DIRECTION-SIGNAL-CANCELLING MECHANISM

Masaru Suzuki, Hekikai-gun, and Yoshihiro Kawai, Nagoya, both of Japan, assignors to Kabushiki-Kaisha Tokai Rika Denki Seisakusho, Nishi-Kasugai-gun, Aichi-ken, Japan

Filed Mar. 31, 1970, Ser. No. 24,101
Claims priority, application Japan, Sept. 13, 1969, 4,487,296
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.34 3 Claims

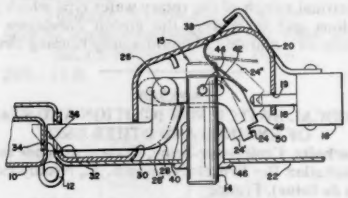


A direction-signal-cancelling mechanism which is releasably assembled into the direction-signal-indicating apparatus of a vehicle, comprises an axially projecting tubular column integral with the base of said indicating apparatus and having a bore diameter sufficient a steering shaft to extend therethrough, an annular cam member having a bore diameter also sufficient for the steering shaft to extend therethrough and provided at its periphery with at least one axially extending lobe and at its upper end with at least one axially extending pin which is integral with said cam member sn engageable in a counterbore provided in the steering wheel for interconnecting the cam member and the steering wheel when said wheel is rotated and said pin and counterbore come into alignment with each other, either one of said tubular column and said cam member being insertedly mounted on the other so as to permit said cam member to be axially slidable and rotatable and to permit said lobe to project radially outwardly to engage a latch means on the indicating apparatus to effect automatic cancelling of the vehicle's direction signals, a spring means compressed between a flange provided on the cam member and the tubular column yieldably urging the cam member as a whole upwardly towards the steering wheel, and a flange provided on either one of said tubular column or said cam member limiting the extent of the upward movement of said cam member.

3,609,265
DUAL-ACTUATED SWITCH-OPERATING MECHANISM

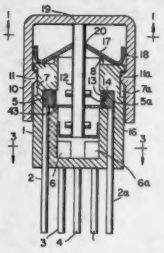
Siegfried Garbe, North Canton, and Joseph F. Oles, Canton, both of Ohio, assignors to The Hoover Company, North Canton, Ohio

Filed June 25, 1970, Ser. No. 49,665
Int. Cl. H01h *3/16*
U.S. Cl. 200—61.62 5 Claims



This invention in the preferred form relates to a dryer door switch-operating mechanism which in major part comprises a single-operation member adapted for both axial and rotary motion. Operation of the member requires both motions and in sequential order of first axial motion caused by closing of the door and then rotary motion created by manual reset to close the switch.

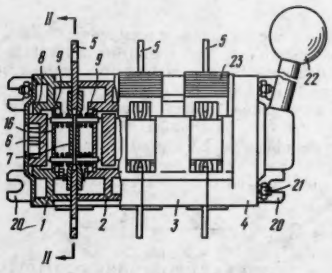
3,609,266
SNAP MECHANISM FOR USE WITH AN ELECTRICAL SWITCH, VALVE OR THE LIKE
Eli Raitport, 1807 Mower St., Philadelphia, Pa
Filed Apr. 18, 1969, Ser. No. 821,547
Int. Cl. H01b 3/12
U.S. Cl. 200—67 9 Claims



1. Electrical snap switch with a spring in the form of a closed loop freely located within the body.

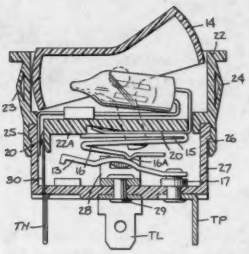
2. Snap mechanism electrical and fluid, with a memory; consisting of a body, terminals, pusher operator and a cup-shaped snapping member which has at least two relaxed positions substantially different from each other.

3,609,267
ELECTRIC LOAD CHANGEOVER SWITCH WITH MOVABLE CONTACTS INSERTABLE IN A ROTARY SHAFT, AND ARC DISCHARGE CHANNELS
Nikolai Ivanovich Egorov, ulitsa Lenina, 397/5, kv. 74; Jury Grigorievich Kron, ulitsa Mira, 324A, kv. 4; Jury Ivanovich Moiseev, ulitsa Mira, 463, kv. 72, and Jury Alexandrovich Putov, ulitsa Mira, 270, kv. 11, all of Stavropol, U.S.S.R.
Filed Aug. 27, 1969, Ser. No. 853,252
Claims priority, application U.S.S.R., Aug. 27, 1968, 1265425
Int. Cl. H01h 19/40, 9/08
U.S. Cl. 200—155 2 Claims



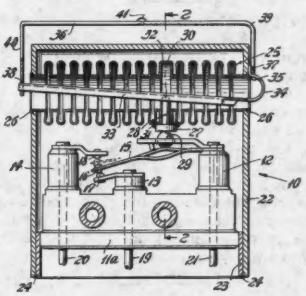
An electric load switch, comprising a set of blocks each formed of an insulating material having fixed contacts located in them and a changeover shaft extending through these blocks with movable contacts mounted on it, wherein the switch is simple in design and comparatively small in size, reliable in operation, and easily assembled for a plurality of poles of an electric circuit due to the presence of unified or connectable elements.

3,609,268
INTEGRATED ROCKER-SWITCH AND INDICATOR-LIGHT UNIT
Gil C. Sanchez, 2915 Miles Ave., Bronx, N.Y.
Filed May 25, 1970, Ser. No. 40,205
Int. Cl. H01h 9/18
U.S. Cl. 200—167 A 6 Claims



An integrated electrical rocker-switch and indicator-light unit including an actuator pivotally mounted in an insulating box, the actuator being hollow and being formed of translucent plastic material within which is disposed an indicator lamp in series with a resistor. The arrangement is such that when the actuator is manually shifted to the "on" state, the switch contacts associated therewith are closed and the lamp is illuminated, and when shifted to the "off" state, the switch contacts are opened and the lamp is deenergized.

3,609,269
HERMETICALLY SEALED SWITCH
Robert R. Hellman, Bridgeport, Conn., assignor to Wesport Development of Manufacturing Company, Inc., Milford, Conn.
Filed Apr. 17, 1970, Ser. No. 29,444
Int. Cl. H01h 9/04
U.S. Cl. 200—168 G 7 Claims

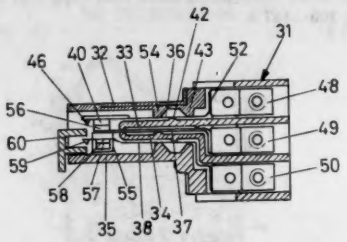


An hermetically impervious electrical switch of the snap action type that is enclosed in a container and is actuated by distortion of the sidewall of a tube.

3,609,270
ELECTRIC REVERSING SWITCH
Jorgen Jorgensen, Sonderborg, and Tage S. Basse, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark
Filed Jan. 15, 1970, Ser. No. 3,045
Claims priority, application Germany, Feb. 14, 1969, P 19 67 418.1
Int. Cl. H01h 13/36
U.S. Cl. 200—67 D 1 Claim

The invention relates to an electric reversing switch assembly having at least one fixed contact and a pair of mova-

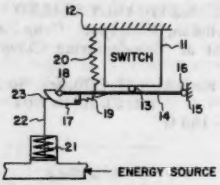
ble contacts. The assembly includes a main contact actuating arm and a snap-action spring, such as an omega spring, attached to the actuating arm. The movable contacts have lugs and are resiliently biased towards the fixed contact. An actuating element connected to the actuating arm lifts one of said movable contacts from the fixed contact while allowing the other of the movable contacts to abuttingly engage the fixed contact.



3,609,271
PRESSURE-OPERATED ELECTRICAL SWITCH RESPONSIVE TO A PRESSURE DECREASE AFTER A PRESSURE INCREASE

Frederick W. Gibson, Hampton, Va.

Filed Dec. 1, 1969, Ser. No. 881,041
Int. Cl. H01h *43/28, 35/24*
U.S. Cl. 200—81 R **3 Claims**



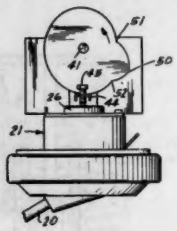
A pressure-operated electrical switch with means to hold the switch closed until the pressure increases to a first predetermined value and then decreases to a second predetermined value at which time the holding means is released and the switch is opened. The holding means consists of a rod pivoted at one end with a tension spring attached near the other end of the rod. The releasing means includes a pawl attached to the other end of the rod, a compression spring subjected to the pressure, a second rod with one of its ends attached to said compression spring and with a hook on its other end to slip over said pawl and pull the pivoted rod away from the switch.

3,609,272
PRESSURE SWITCH WITH ADJUSTING CAM OF PARTICULAR CONFIGURATION

Douglas A. Heaps, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Nov. 10, 1969, Ser. No. 875,426
Int. Cl. H01h *35/34*
U.S. Cl. 200—83 WM **5 Claims**

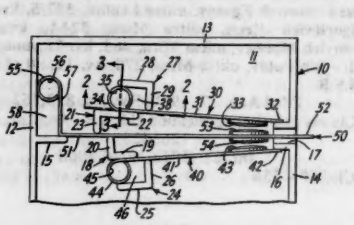
A pressure-responsive switch assembly, particularly suitable for use in automatic washing machines, embodying a fluid-pressure-responsive diaphragm, a switch arm operated by movement of the diaphragm, a pair of contacts selectively engageable by the switch arm depending upon the position of the diaphragm, with biasing means for applying a variable biasing force on the diaphragm in opposition to the fluid pressure acting thereon, in combination with a cam having its periphery in camming engagement with the biasing means, the cam having a projection thereon arranged to depress the biasing means sufficiently to move the switch arm from engagement with one of the contacts to a reset position in which it engages the other of the contacts, with means for rotating the cam in one direction only, the cam being so formed as to provide incremental changes in the pressure on the biasing means upon rotation thereof so that rotation of the cam through one complete revolution serves to momentarily place the switch assembly in its reset position.



3,609,273
TERMINAL-ENDED SPRING BLADE CONTACT ARM SECURING MEANS

Claude V. Koch, Two Rivers, and Donald G. Storms, Manitowoc, both of Wis., assignors to AMF Incorporated

Filed July 27, 1970, Ser. No. 58,609
Int. Cl. H01h *1/58*
U.S. Cl. 200—166 CT **9 Claims**



In a switch, a case having at least one external wall with integral wall means extending therefrom inwardly into the case, at least one spring blade contact arm in the case having a free contact end and a terminal end with a tubular terminal portion which extends laterally across the end of the blade, the wall means and the terminal end of the spring blade contact arm defining a pocket closed at the bottom by the external wall, and a dielectric material substantially filling the pocket and acting to prevent separation of the contact arm and case.

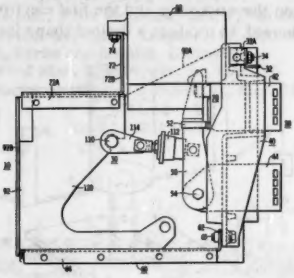
3,609,274
CIRCUIT BREAKER INCLUDING IMPROVED SUPPORTING FRAME

Fred Bould, Pittsburgh, and Nagar J. Patel, East McKeesport, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 27, 1970, Ser. No. 6,242
Int. Cl. H01n *9/02*
U.S. Cl. 200—168 A **9 Claims**

A circuit breaker comprising a supporting frame structure including a rear wall portion and a bottom support plate projecting outwardly therefrom. The rear wall portion includes an upper crossmember and a plurality of insulating support

members which project downwardly from the upper cross-member to be joined to the bottom support plate. Separable



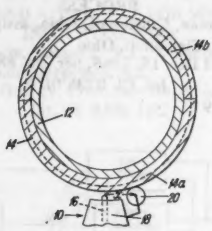
contact means are mounted on the insulating support members.

3,609,275

BUTT WELDING OF TUBE PLATES AND THE LIKE

Daniel F. T. Roberts, Bexley; Terence R. Wilkins, Northolt, and John Graham, Hartlepool, all of England, assignors to Foster Wheeler Corporation, Livingston, N.J.

Filed Feb. 24, 1970, Ser. No. 13,469
Int. Cl. B23k *1/06*
U.S. Cl. 219—60 A 6 Claims



The invention relates to the butt-welding of parts such as tubes, plates or the like. When such parts are butt-welded using a filler wire, it often happens that this will break or snap out of position and so cause a faulty weld. According to the invention, the welding torch has a heat-resisting shoe or roller which resiliently bears against the filler wire closely in front of that part of the wire being melted by the arc so retaining the wire in position.

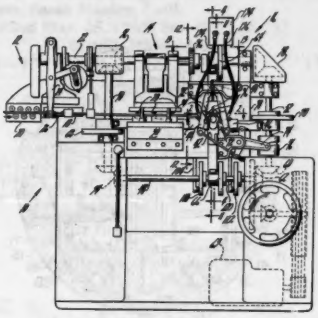
3,609,276

MACHINE FOR PRODUCING WELDED BEARINGS AND THE LIKE

Erman V. Cavagnero, Torrington, Conn., and Joseph F. Loftus, Springfield, Ohio, assignors to Torin Corporation, Torrington, Conn.

Division of Ser. No. 721,672, Apr. 16, 1968, Pat. No. 3,562,473.
Filed June 8, 1970, Ser. No. 44,480
Int. Cl. B23k *1/16*
U.S. Cl. 219—64 7 Claims

A high production machine of the vertical four-slide type for intermittently advancing strip stock, severing blanks therefrom, forming the same into bearing races and welding end portions thereof together. The machine has a projecting horizontal mandrel with three work stations therealong respectively for preforming, forming and preheating and/or welding. A cutoff anvil, transfer pins, broaching tools, and an expandable mandrel section are provided all with rear motion drive action and a welding mechanism is adapted for both preheat and weld operation adjacent the expandable



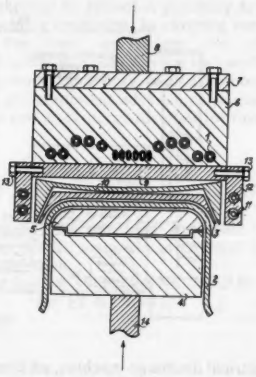
mandrel section. A bearing race discharge track extends from the welding station to an induction furnace.

3,609,277

BRAZING PRESS PARTICULARLY FOR BRAZING EXTENDED SURFACES HAVING RELIEVED CORNERS TO A MATCHING PLATE

Bernard Dallet, Savigny-sur-orge; Jacques Doucerain, Paris, and Jean Moulin, Ris-Orangis, all of France, assignors to Societe de Traitements Electrolytiques et Electrothermiques (S.T.E.L.)

Filed July 13, 1970, Ser. No. 54,281
Claims priority, application France, May 14, 1970, 7017659
Int. Cl. H05b *5/00*
U.S. Cl. 219—6.5 6 Claims



To unite surfaces with relieved corners, such as the bottoms of shaped cooking utensils, pots, pans or skillets, to a heat distribution plate, an intermediate or buffer plate having a slightly concave, thin central region is applied around the plate to be brazed, or fused to the bottom of the utensil, the buffer plate having peripheral edges matching the edges of the plate; and the press further includes peripheral heating coils, for example energized by high frequency, to provide additional high frequency induction heating at the edges.

3,609,278

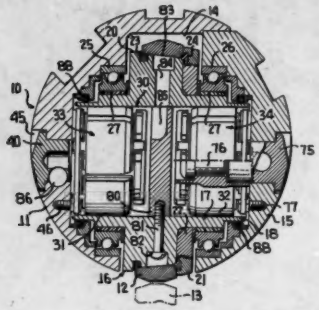
TUBE-WELDING APPARATUS

John T. Cary, 3144 Wilshire Ave., Markham, Ill.

Division of Ser. No. 841,812, July 15, 1969.
Filed Nov. 6, 1970, Ser. No. 87,375
Int. Cl. B23k *1/06*
U.S. Cl. 219—66 2 Claims

This disclosure has to do with a tube-welding apparatus which includes a horn and a rotary internal electrode

mounted within the horn for cooperation with an external electrode. The internal electrode is carried by a rotary support member which, in turn, is coupled to the horn by a rotary electrical joint. Means are provided for quickly replacing elements of the electrical joint and also for replacing components thereof which are subject to wear.

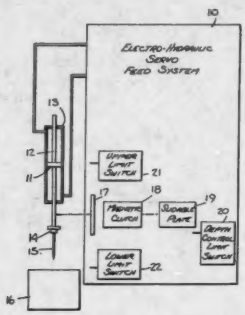


3,609,279

WEAR-RESPONSIVE ELECTRODE-WITHDRAWAL CONTROL SYSTEM FOR AN ELECTRICAL DISCHARGE MACHINE

George G. Giesbrecht, Kitchener, and Gino Campagnola, Waterloo, Ontario, both of Canada, assignors to Uniroyal Inc., New York, N.Y.

Filed Aug. 18, 1969, Ser. No. 850,879
Int. Cl. B23p *1/14*
U.S. Cl. 219—69 G **3 Claims**



In an electrical discharge machine, an electrohydraulic servosystem positions an electrode near a workpiece to erode the workpiece until a depth control limit switch is actuated by a mechanism coupled through a magnetic clutch to the electrode-carrying member. After the electrode is worn to such an extent that it must be replaced a second limit switch is actuated before the actuation of the depth control limit switch, causing a withdrawal of the electrode to an upper position where the electrode can be replaced after completion of the erosion made during the positioning of the electrode when the second limit switch is actuated.

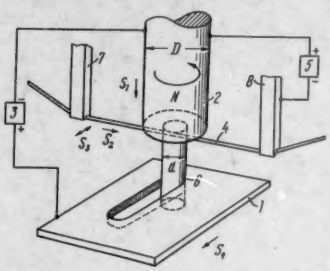
3,609,280

METHOD OF MAKING APERTURES AND SLOTS IN ELECTRICALLY CONDUCTIVE WORKPIECES BY EDM

Evgeny Vasilievich Kholodnov, ulitsa Vokzalnaya, 21, kv. 30, Fryazino Moskovskoi oblasti, U.S.S.R.

Filed Nov. 4, 1969, Ser. No. 873,856
Int. Cl. B23p *1/08*
U.S. Cl. 219—69 M **3 Claims**

A method of forming an aperture in an electrically conductive workpiece by a spark-eroding technique, comprises rotating an electrode tool while simultaneously the work displacing the same axially along its axis of rotation towards the workpiece to bring a working portion of the tool into proximity with the workpiece to form an aperture in the workpiece while concurrently introducing an additional electrode tool between the workpiece and the first electrode tool at an end face thereof, to produce a desired shape for the working portion of the first electrode tool. The additional electrode tool can be displaced longitudinally thereof, to compensate for wear of the additional electrode in the course of formation of the working portion of the first tool. Also the additional electrode can be displaced transversely to vary the diameter of the working portion of the first tool and thereby vary the diameter of the aperture which is formed in the workpiece.

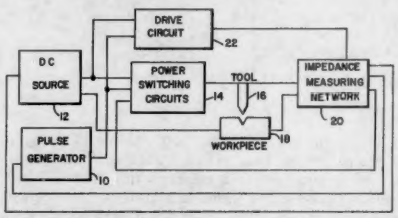


3,609,281

METHOD AND APPARATUS FOR DETECTING SHORT CIRCUITS IN THE MACHINING GAP IN AN EDM PROCESS

Harry D. Kauffman, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

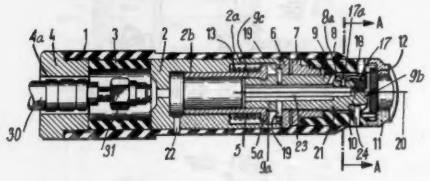
Filed Dec. 15, 1969, Ser. No. 885,027
Int. Cl. B23k *9/16*
U.S. Cl. 219—69 C **7 Claims**



A method and apparatus for accurately determining the presence and magnitude of a short circuit condition in an electrodischarge machining (EDM) process. An electrically conductive tool and an electrically conductive workpiece are connected to a pulse-producing power supply and positioned in a dielectric medium to form a machining gap therebetween. The machining gap is placed in an impedance-measuring circuit as the impedance to be measured. The impedance-measuring circuit checks the gap condition by measuring the impedance of the machining gap between pulses from the power supply. In the embodiment disclosed, changes in gap impedance between output pulses are detected by a modified wheatstone bridge. During the time between pulses, a voltage less than the ionization voltage is applied to the bridge. If there is no short circuit condition, the bridge is balanced; and the bridge output is zero. A short circuit condition will cause an imbalance in the bridge producing a resultant error signal on the bridge output. This output is fed back within the power supply causing a change

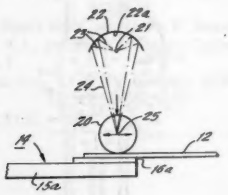
in its output parameters which will tend to alleviate the short circuit condition.

3,609,282
MICROWELDING TORCH
Hermann Trattner; Fritz Brosamle, and Friedrich Wustner, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Mar. 7, 1969, Ser. No. 805,296
Claims priority, application Switzerland, Mar. 15, 1968, 3874/68
Int. Cl. B23k 9/28
U.S. Cl. 219—75 **10 Claims**



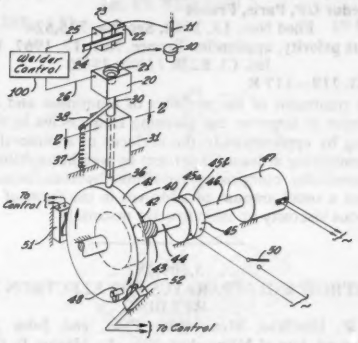
A electrode clamp that is received by and readily detachable from a machine held microwelding torch insulating body member comprises a broad, easily adjustable clamp means holding a plurality of nonmelting electrodes whereby a plurality of connection points on articles being manufactured can be welded by consecutively opening and closing the welding circuits of the electrodes and the points of connection.

3,609,283
METHOD AND APPARATUS FOR SOLDERING INSULATED WIRE
Bernard J. Costello, Ringoes, N.J., assignor to Argus Engineering Company, Hopewell, N.J.
Filed Oct. 29, 1969, Ser. No. 872,232
Int. Cl. B23k 1/02
U.S. Cl. 219—85 **9 Claims**



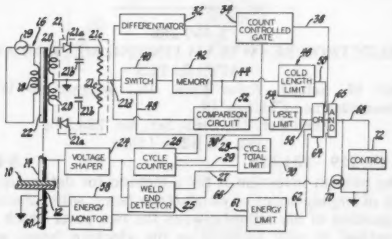
A method and apparatus for stripping and soldering very fine insulated wire. A number of such wires may be stripped and soldered simultaneously whereby the insulated wires are each positioned above an associated terminal pad, a radiation transparent rod is firmly urged against all of the wires and is vibrated preferably in a reciprocating fashion, in a direction parallel to the length of the wires, substantially simultaneously with the application of radiation from a heat source which simultaneously irradiates all of the wires and their associated pads through the radiation-transmissive element. The radiation focused upon the wires causes a solder predeposited upon the terminal pads to melt and wet the pads, and also heat the wire whereby the insulation is softened to the point where it is split by the reciprocating force and is floated away by the solder which runs through the ruptured insulation and up and around the bare wire to form an excellent solder joint between the wire and pad, and wherein the heat applied is sufficient to form a good solder joint and yet insufficient to damage any neighboring heat-sensitive elements.

3,609,284
WELDER
Delbert L. Phillips, Malibu, and Lewis Clark Feightner, Chatsworth, both of Calif., assignors to New Twist Connector Corporation, Santa Monica, Calif.
Filed Mar. 25, 1968, Ser. No. 715,773
Int. Cl. B23k 11/04
U.S. Cl. 219—97 **13 Claims**



One of two small workpieces that are to be welded together is slidingly mounted in a fixed workholder and the other is firmly gripped by a movable workholder. To carry out an operating cycle, the movable workholder is reciprocated by two lobes of a cam that makes one revolution when momentarily connected to a relatively large mass that rotates at constant velocity. Initially the first slidable workpiece is placed at random at a position that is advanced slightly from the position desired for the welding operation but the first reciprocation of the second workpiece is against the slidable workpiece to retract it precisely to the desired position for a welding operation. In carrying out the second reciprocation, the two workpieces are charged by capacitance and as the gap between the two workpieces narrows a high frequency pulse triggers an arc between the two workpieces and the continued advance of the second workpiece crowds the two workpieces together for final fusion.

3,609,285
METHOD AND APPARATUS FOR MONITORING WELD QUALITY
August F. Scarpelli, Warren, and Frederick J. Trulson, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Sept. 4, 1968, Ser. No. 757,320
Int. Cl. B23k 11/24
U.S. Cl. 219—109 **9 Claims**



A circuit for monitoring spot welding is responsive to electrode separation and welding current and voltage to monitor the weld soft point and upset, the cold length of the parts, the number of cycles of welding current, and the energy consumed in producing the weld nugget. A reject signal is provided if any of the five parameters fall outside of predeter-

mined limits. A special feature is the upset circuitry which uses a memory circuit and a comparison circuit to compare the initial electrode separation with the final separation.

3,609,286

PROCESS FOR TREATMENT OF ALUMINUM AND ALLOYS OF ALUMINUM FOR RESISTANCE WELDING

Yves Bresson, Coublevie; Roger Lorain, Issoire, and Marcel Brillant, Fontenay le Fleury, all of France, assignors to Cegedur GP, Paris, France

Filed Nov. 13, 1968, Ser. No. 775,524

Claims priority, application France, Nov. 17, 1967, 128,587

Int. Cl. B23k *11/00, 35/36*

U.S. Cl. 219—117 R **3 Claims**

The treatment of the surfaces of aluminum and alloys of aluminum to improve the cleaning frequencies in resistance welding by application to the surfaces of a mineral oil mixture containing at least 60 percent by weight naphthenes with the remainder comprising paraffinic hydrocarbons with or without a small amount of additives in the form of dopes of unctuous viscosity or anticorrosive materials.

3,609,287

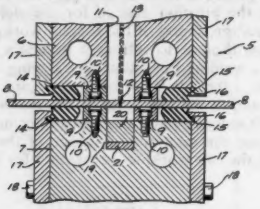
METHOD AND APPARATUS FOR ELECTRON BEAM WELDING

John F. Hinrichs, Menomonee Falls, and John J. Chyle, deceased, late of Milwaukee, Wis. (by Marion D. Chyle, executrix), assignors to A. O. Smith Corporation, Milwaukee, Wis.

Continuation-in-part of application Ser. No. 718,296, Mar. 4, 1968, now abandoned. This application Jan. 22, 1970, Ser. No. 4,859

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 EB **5 Claims**



This invention relates to a method of welding low carbon steel using an electron beam. The portion of the workpiece being welded is located in an evacuated welding zone and a deoxidizing metal backup member is disposed in spaced relation to the joint to be welded. During welding, the electron beam vaporizes a portion of the deoxidizing metal and the release of the metal vapor aids in increasing the soundness of the weld.

3,609,288

ELECTRON BEAM SEAM-FINDING METHOD AND APPARATUS

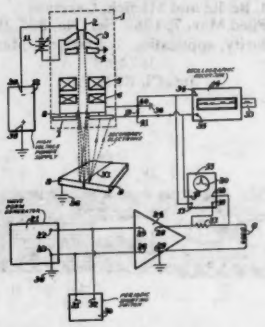
Albert M. Sciaky, Palos Park, Ill., assignor to Welding Research, Inc., Chicago, Ill.

Filed Dec. 18, 1968, Ser. No. 784,574

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 EM **9 Claims**

The present invention is for a method for determining the point of impingement of an electron beam with reference to the position of the seam between the two parts which are to be welded as may be used in the electron beam welding process. The electron beam is oscillated along a line transverse to the seam or along any other convenient path which traverses the seam. Secondary electrons emitted from the surface of the workpieces being scanned by the oscillating beam are collected by an electrode mounted above the work surface. The changes in secondary electron current through the electrode are displayed on the face of the cathode-ray oscilloscope whose horizontal sweep is controlled by the oscillator which is generating the electron beam scanning waveform. The signal generator or oscillator which produces the scanning signal is periodically shorted for preset intervals so that the beam remains in its "at rest" position during these intervals and the horizontal sweep is also "at rest" during these intervals so that a bright marker spot is displayed on the cathode-ray oscilloscope which defines the rest position



of the electron beam as it strikes the work. By moving the workpieces with respect to the electron beam in a direction transverse to the seam, this marker spot may be brought to superimpose over the pattern of secondary emission current at a point which indicates the minimum secondary emission. This is the point at which the beam is striking the workpieces at the seam.

3,609,289

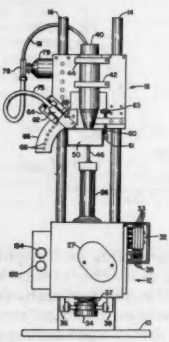
WELDING APPARATUS

Kenneth J. Hathaway, Nashua, N.H., assignor to Air Control Industries, Inc., Nashau, N.H.

Filed Dec. 11, 1969, Ser. No. 884,074

Int. Cl. B23k *9/00*

U.S. Cl. 219—130 **15 Claims**



An automatic welding apparatus includes a housing that is pivotably and slidably mounted to a base and a spindle, adapted for reception of a workpiece, is rotatably and slidably mounted to the housing. A carriage having a torch, a heat sink and a finger slidably and rotatably mounted thereto is slidably supported by the shafts affixed o the housing. The working end of the torch is formed with an opening and a plurality of ports are radially disposed about the opening. An electrode extends through the opening and an inert gas exhausts through the ports. A voltage sensor generates a signal representative of the spatial relationship between the torch and the workpiece, the slidable movement of the torch being responsive to the voltage sensor signal. Programmable cam means, preset for tacking or continuous welding, is provided

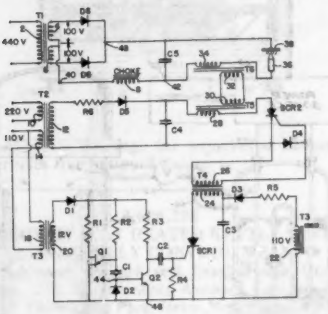
for switching the arc current, and means are provided for ejecting the workpiece out of the spindle upon completion of the welding cycle.

3,609,290

ELECTRIC ARC CONTROL SYSTEM

Gerald A. Lawrence, Detroit, Mich., assignor to La-Mark Corporation, Detroit, Mich.

Filed Dec. 13, 1968, Ser. No. 783,633
Int. Cl. B23k 9/10
U.S. Cl. 219—131 R 8 Claims



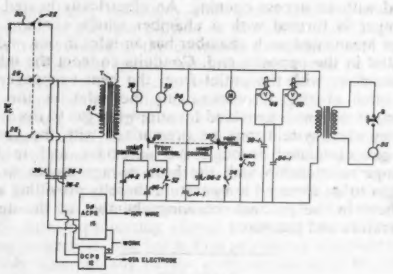
An all solid-state electric arc starting and control system which may be used for electric welding or cutting operations. The control system includes a three-stage amplification of the output of a unijunction transistor relaxation oscillator. This produces a high frequency control current which regulates the main heavy duty welding current, and will serve to automatically restart the electric arc should the main welding current fail.

3,609,291

ARC WELDING CONTROL SYSTEM FOR A MANUAL TORCH

Frank J. Pilia, Short Hills, and John F. Saenger, Jr., Springfield, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 13, 1969, Ser. No. 849,824
Int. Cl. B23k 9/10
U.S. Cl. 219—131 R 2 Claims



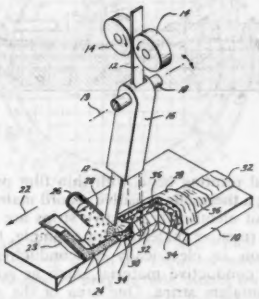
A control system for a manually operated welding torch housing a nonconsumable electrode and a consumable wire electrode including a power supply having a DC and AC output, the DC output being connected in circuit relation with the nonconsumable electrode and a workpiece, the AC output being connected in circuit relation with the consumable electrode and the workpiece, feeding means for the consumable electrode, and a single manually operated selector switch which controls both the delivery of power to the consumable and nonconsumable electrode and the consumable electrode feeding means.

3,609,292

OSCILLATING STRIP BULKWELDING

Roman F. Arnoldy, Houston, Tex., assignor to R. I. Patents, Inc., Houston, Tex.

Filed Feb. 24, 1969, Ser. No. 801,374
Int. Cl. B23k 9/00
U.S. Cl. 219—137 10 Claims



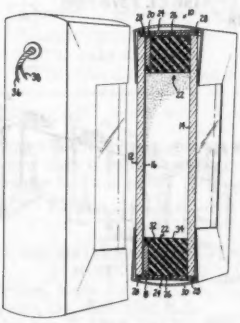
The present invention encompasses a method of welding which utilizes in the preferred embodiment a consumable strip electrode having dimensions in the range of approximately one-half inch in width and from 0.001 to 0.015 inches in thickness, and which electrode is moved parallel to the base metal that is being welded. In addition, the strip electrode is oscillated in a path of travel that is generally perpendicular to the parallel movement of the electrode relative to the base metal. A layer of granular alloy material is laid on the base metal in order to give a weld bead having a specific composition with a closely controlled analysis. To achieve an operation having a high capacity with a variety of compositions being available for the weld, the granular material is fed at a granular-to-electrode weight ratio of approximately 1-to-1 to 3-to-1.

3,609,293

ELECTRICALLY HEATED MULTIPLE GLAZED WINDOW

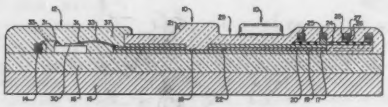
John L. Stewart, Apollo, and George H. Bowser, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 1, 1969, Ser. No. 846,847
Int. Cl. H05b 1/00
U.S. Cl. 219—200 21 Claims



A heated, multiple glazed insulating unit having a marginal edge spacer element composed of electrically insulting material.

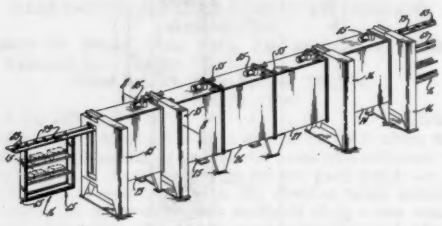
3,609,294
THERMAL PRINTING HEAD WITH THIN FILM PRINTING ELEMENTS
Richard C. Cady, Jr., and Robert M. Whiteley, both of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Continuation of application Ser. No. 672,131, Oct. 2, 1967, now abandoned. This application Oct. 10, 1969, Ser. No. 866,140
Int. Cl. H05b 1/00
U.S. Cl. 219—216 10 Claims



A thermal printing head with thin film printing elements for marking a thermally sensitive record material is disclosed. A number of electrically resistive strips are etched from an electrically resistive material (for example, tantalum) which is formed on an electrically nonconductive substrate. An electrically conductive material, such as gold, is deposited over the tantalum strips. One area of the gold along each gold strip is then selectively etched by an etchant which does not affect the tantalum layer. The gold layer is now divided into two separate electrode portions. One electrode portion of each strip is connected to an isolation element, such as a semiconductor diode, a silicon controlled rectifier, or a semiconductor threshold device. The isolation element may be chip mounted, or it may be formed by semiconductor fabrication techniques. The isolation element is supported by the same substrate which supports the tantalum strips. The other electrode portion of each strip is connected to a second level electrical conductor, which is electrically insulated from the first level electrodes that pass under this electrical conductor by a thin dielectric layer.

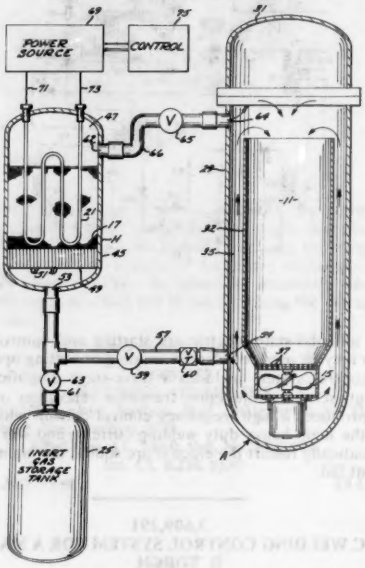
A protective overcoating layer is deposited over the entire structure. One embodiment of the present invention employs a protective overcoating layer of a material having a substantial thermal conductivity and a substantial electrical resistivity which is shaped to provide a raised area over each of the resistive tantalum printing elements, so as to provide a plurality of selectively heat-concentratable raised areas for printing.

3,609,295
HEATING APPARATUS WITH WORKPIECE CARRIERS
Irvin P. Bielefeldt, Rockford, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.
Filed July 1, 1970, Ser. No. 51,612
Int. Cl. F27b 9/06
U.S. Cl. 219—388 12 Claims



Workpieces advanced into and heated radiantly within a series of end-to-end chambers are supported by movable carriers with reflective shielding packs which concentrate the radiant heat on the workpieces to promote rapid and uniform heating of the workpieces. In one embodiment, auxiliary heating elements are supported on the carriers themselves and are energized differentially as the carriers are advanced into the different chambers.

3,609,296
ELECTRICALLY HEATED AUTOCLAVE APPARATUS
Joe B. Blair, Artesia, Calif., assignor to Fuel Engineering, Torrance, Calif.
Filed Mar. 27, 1970, Ser. No. 23,276
Int. Cl. F27d 11/02
U.S. Cl. 219—400 4 Claims

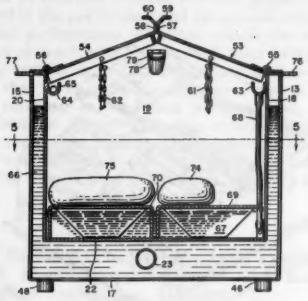


An autoclave apparatus comprising an autoclave forming a product-receiving chamber having an inlet port in one end and an outlet port in the opposite end and being, further, formed with an access opening. An electrically heated heat exchanger is formed with a chamber which contains heat storage means and such chamber has an inlet in one end and an outlet in the opposite end. Conduits connect the inlet to the autoclave with the outlet from the heat exchanger and the outlet of the autoclave with the inlet to the heat exchanger. Means is provided for supplying gas to the system whereby such system may be pressurized with the gas and such gas circulated through the autoclave and in heat-exchange relationship with the heat storage means to heat such gas to an elevated temperature thereby providing an atmosphere in the product-receiving chamber of the desired temperature and pressure.

3,609,297
MOISTURE WARMING DEVICE
Petros D. Christopoulos, 363 Woodmere S. E., Grand Rapids, Mich.
Filed Feb. 24, 1969, Ser. No. 801,359
Int. Cl. F27d 11/00
U.S. Cl. 219—439 5 Claims

A water-jacketed container with heat supplied to the jacket space to heat water in the interior primarily by conductive heat-transfer through the interior container wall. Articles are supported above the level of the water in the interi-

or, which is isolated with respect to pressure from the jacket water to permit side-jacketing above the level of the interior



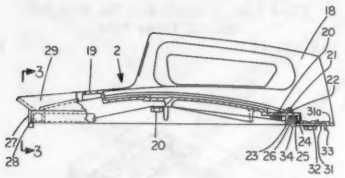
water. Condensate drainage for unjacketed surfaces maintains the articles free of liquid water.

3,609,298

ELECTRICALLY HEATED KETTLE WITH DISASSEMBLY CONTROL MEANS

Gerald J. Adamson, 18 Parkcrest, Scarborough, Ontario; Ian F. Norton, 272 St. Clements Avenue, Toronto; John W. Miller, 49 Thorncliffe Park Drive, Apartment 603, Toronto, Canada; John C. Fagan, 16 Wyndmoor Drive, Philadelphia, Pa., and John L. Eaton, Jr., 617 Delaware, Delanco, N.J.

Filed June 17, 1970, Ser. No. 48,583
Int. Cl. F27d *11/02*
U.S. Cl. 219—441 **9 Claims**



An electric kettle comprising a container component, a lid component and a control component with the lid component being releasably interrelated with the container component at front and rear portions of the kettle and with the control component being releasably interrelated with the container component in the rear portion of the kettle and being positioned with respect to the container component and the lid component so that the control component must be released before release of the lid component from the container component can be had. The container component includes a fixed heating element with an external thermostat sensing projection and a pair of projecting male terminal elements; the lid component includes a handle and pouring spout; and the control component includes a pair of female terminal elements in electrical connection with a power supply cord and mating with the male terminal elements, and a thermostat assembly with a projecting clamp to engage the thermostat sensing projection. The kettle thus provides a componentized assembly wherein any of the components may be readily cleaned or replaced by the user.

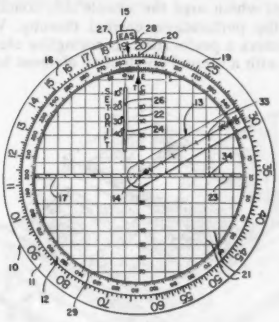
3,609,299

NAVIGATIONAL COMPUTER

Jerauld G. Wright, 10 Wren Road, Ottawa, Ontario, Canada

Filed Mar. 30, 1970, Ser. No. 23,800
Int. Cl. G06c *27/00*; **G06g** *1/08*
U.S. Cl. 235—61 NV **20 Claims**

A computer for solving aerial navigational problems in which the effect of wind speed and direction must be taken into account, wherein calibrated drift marks are provided in association with the airspeed scale. When the computer is set to any given airspeed and the information relating to wind speed and direction is registered, the calibrated drift marks give an immediate reading of the corresponding drift angle. The computer comprises a number of superimposed concentric discs which are mutually rotatable and which bear scales and cursors by means of which the required information can be derived. The computer may include means for correcting for magnetic variation in compass headings, pressure-altitude/temperature in airspeeds, and may also include scales for performing time/distance calculations.

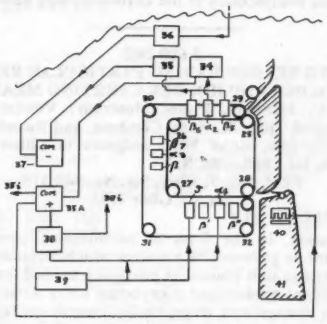


3,609,300

AUTOMATIC FARE CHARGING DEVICE

John Wolfgang Halpern, 2 Field Court, London, W.C.1, England

Continuation of application Ser. No. 629,046, Feb. 10, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 261,529, Feb. 27, 1963, now abandoned , and a continuation-in-part of 659,196, Feb. 16, 1967, now abandoned. This application May 13, 1969, Ser. No. 827,095
Int. Cl. G06k *21/00*
U.S. Cl. 235—61.7 R **21 Claims**



A token having electrically operable storage means is accepted and stored data is read from the token, data compared, and passenger fare computed.

3,609,301

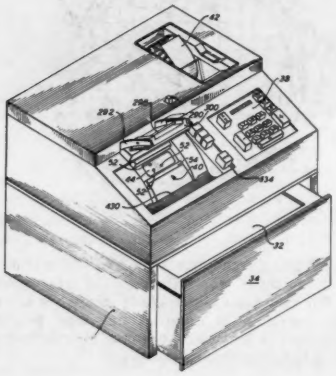
STAR WHEEL RECORD READER HAVING WHEEL TIP ALIGNING MEANS

John F. Henderson, Essex County, N.J., assignor to Litton Business Systems, Inc., Belleville, N.J.

Filed Aug. 7, 1969, Ser. No. 848,271
Int. Cl. G06r *7/04*
U.S. Cl. 235—61.11 C **18 Claims**

Information, in the form of perforations carried by a record card, is gathered by a system which includes an infor-

mation storage unit housed in proximity to, and for coaction with, a record reader, and a keyboard entry device. The information storage unit magnetically records on tape the information transmitted to it from either the reader or the keyboard. The reader, through the use of star wheels, reads the perforated data one column at a time and transmits same through appropriate logic to the storage unit. The star wheels are mounted in cantilever fashion on first conductive springlike elements which urge the wheels into coaction with the record and the perforations carried thereby. When a star wheel encounters a perforation its springlike element moves into contact with a second conductive element to close a circuit. Said second conductive element is formed to yield when contacted by said first element to insure proper seating of the star wheel in the perforation and subsequent coaction thereof with other perforations. The star wheels are mounted in a stationary manner; while the record, after being laid upon a receiving bed, is moved in an arcuate path and in such a manner that it is locked in its position, sensed by the star wheels, returned to its initial position, and subsequently ejected from the reader. If the data sensed is unacceptable to the logic the record remains on the reading bed as an indication thereof. The operator, thereafter can enter the data through the intermediary of the keyboard entry device.



3,609,302

RECORD READER HAVING PARTICULAR RECORD HOLDER AND HOLDER CARRYING MEANS

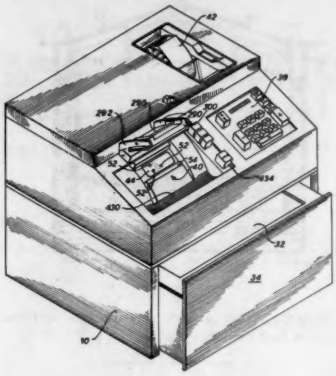
Edward C. Marshall, Upper Montclair; Vincent Corsini, Pequannock; John H. King, Chatham, and Russell W. Larson, Montville, all of N.J., assignors to Litton Business Systems, Inc., Belleville, N.J.

Filed Aug. 7, 1969, Ser. No. 848,315

Int. Cl. G06r *7/04*

U.S. Cl. 235—61.11 C **10 Claims**

Information, in the form of perforations carried by a record card, is gathered by a system which includes an information storage unit housed in proximity to, and for coaction with, a record reader, and a keyboard entry device. The information storage unit magnetically records on tape the information transmitted to it from either the reader or the keyboard. The reader, through the use of star wheels, reads the perforated data one column at a time and transmits same through appropriate logic to the storage unit. The star wheels are mounted in cantilever fashion on first conductive springlike elements which urge the wheels into coaction with the record and the perforations carried thereby. When a star wheel encounters a perforation its springlike element moves into contact with a second conductive element to close a circuit. Said second conductive element is formed to yield when contacted by said first element to insure proper seating of the star wheel in the perforation and subsequent coaction thereof with other perforations. The star wheels are mounted in a stationary manner; while the record, after being laid upon a receiving bed, is moved in an arcuate path and in such a manner that it is locked in position, sensed by the star wheels, returned to its initial position, and subsequently ejected from the reader. If the data sensed is unacceptable to the logic the record remains on the reading bed as an indication thereof. The operator, thereafter can enter the data through the intermediary of the keyboard entry device.



3,609,303

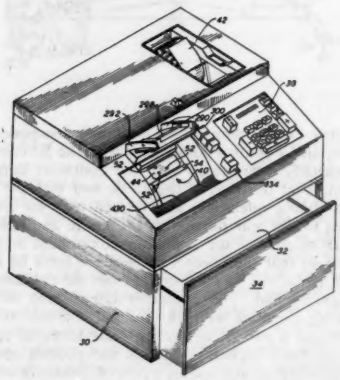
RECORD READER HAVING EJECTOR WITH EJECT INHIBIT MEANS

Edward C. Marshall, Upper Montclair, and John H. King, Chatham, both of N.J., assignors to Litton Business Systems, Inc., Belleville, N.J.

Filed Aug. 7, 1969, Ser. No. 848,306

Int. Cl. G06r *7/04*

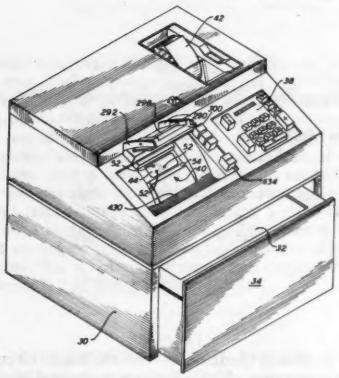
U.S. Cl. 235—61.11 C **15 Claims**



Information, in the form of perforations carried by a record card, is gathered by a system which includes an information storage unit housed in proximity to, and for coaction with, a record reader, and a keyboard entry device. The information storage unit magnetically records on tape the information transmitted to it from either the reader or the keyboard. The reader, through the use of star wheels, reads the perforated data one column at a time and transmits same through appropriate logic to the storage unit. The star wheels are mounted in cantilever fashion on first conductive springlike elements which urge the wheels into coaction with the record and the perforations carried thereby. When a star

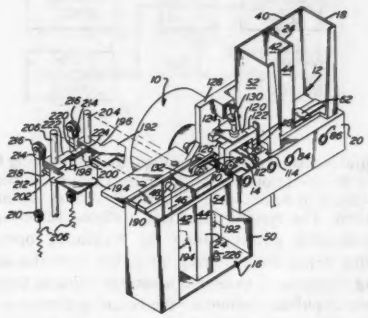
wheel encounters a perforation its springlike element moves into contact with a second conductive element to close a circuit. Said second conductive element is formed to yield when contacted by said first element to insure proper seating of the star wheel in the perforation and subsequent coaction thereof with other perforations. The star wheels are mounted in a stationary manner; while the record, after being laid upon a receiving bed, is moved in an arcuate path and in such a manner that it is locked in position, sensed by the star wheels, returned to its initial position, and subsequently ejected from the reader. If the data sensed is unacceptable to the logic the record remains on the reading bed as an indication thereof. The operator, thereafter can enter the data through the intermediary of the keyboard entry device.

3,609,304
INFORMATION GATHERING SYSTEM
Edward C. Marshall, Upper Montclair, N.J., assignor to Litton Business Systems, Inc., Belleville, N.J.
Filed Aug. 7, 1969, Ser. No. 848,316
Int. Cl. G06r 7/04
U.S. Cl. 235—61.11 C **16 Claims**



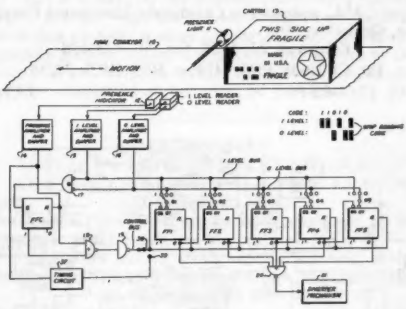
Information, in the form of perforations carried by a record card, is gathered by a system which includes an information storage unit housed in proximity to, and for coaction with, a record reader, and a keyboard entry device. The information storage unit magnetically records on tape the information transmitted to it from either the reader or the keyboard. The reader, through the use of star wheels, reads the perforated data one column at a time and transmits same through appropriate logic to the storage unit. The star wheels are mounted in cantilever fashion on first conductive springlike elements which urge the wheels into coaction with the record and the perforations carried thereby. When a star wheel encounters a perforation its springlike element moves into contact with a second conductive element to close a circuit. Said second conductive element is formed to yield when contacted by said first element to insure proper seating of the star wheel in the perforation and subsequent coaction thereof with other perforations. The star wheels are mounted in a stationary manner; while the record, after being laid upon a receiving bed, is moved in an arcuate path and in such a manner that it is locked in position, sensed by the star wheels, returned to its initial position, and subsequently ejected from the reader. If the data sensed is unacceptable to the logic the record remains on the reading bed as an indication thereof. The operator, thereafter can enter the data through the intermediary of the keyboard entry device.

3,609,305
CARD READER
Cecil J. Davis, and Robert T. Matthews, both of West Chester, Pa., assignors to Bridge Data Products Inc., Philadelphia, Pa.
Filed Oct. 29, 1969, Ser. No. 870,621
Int. Cl. B65h 1/00; G01m 21/30; G06k 7/10
U.S. Cl. 235—61.11 E **19 Claims**



A card reader both 80 and 96 column punched cards and includes a feeder and stacker that can feed and stack both types of cards.

3,609,306
SEQUENTIAL CODE READER
Lawrence W. Langley, Severna Park, Md., assignor to General Electric Company
Continuation of application Ser. No. 419,662, Dec. 21, 1964, now abandoned. This application Dec. 8, 1969, Ser. No. 883,234
Int. Cl. G06k 7/10; G01n 21/30
U.S. Cl. 235—61.11 E **21 Claims**

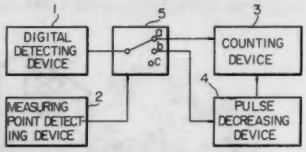


A sequential reading code recognition system for recognizing the code on moving objects to regulate the movement of these objects as the codes thereon are recognized. Three scanners are employed for each station. The first scanner detects the presence of an object and enables the outputs of the other two code reading scanners to be received by the storage unit. The storage unit for the code recognition system for each station contains a preset code. When the code on the object corresponds to the preset code on a bit-by-bit basis an action initiating output is generated.

3,609,307
DIGITAL MEASURING SYSTEM

Yasushi Totsuka, and Shin-ichi Kamachi, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 13, 1970, Ser. No. 036,873
Claims priority, application Japan, May 14, 1969, 44/36709
Int. Cl. G06m *3/10*
U.S. Cl. 235—92 DN **6 Claims**

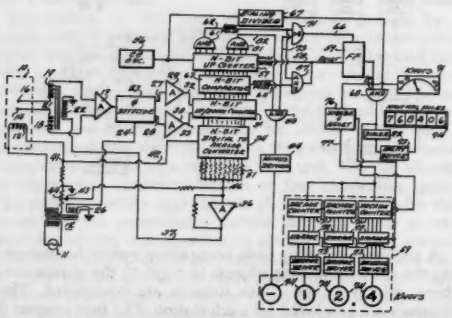


Digital measuring system for digitally determining the position of the center of two specifically set two measuring points in an object to be detected successively during the measuring operation. The system comprises a digital detecting device for generating pulses during the measuring operation, a counting device for receiving the pulses from the digital detecting device so as to obtain measured value in terms of the number of pulses counted by the counting device, a measuring point detecting device for generating a first pulse when the preceding one of the two measuring points is detected thereby while a second pulse is generated when the succeeding one of the two measuring points is detected, a gate circuit for receiving the pulses from the digital detecting device and the measuring point detecting device, and a pulse decreasing device adapted to erase the alternating pulses in the series of input pulses supplied thereto so that the number of the output pulses of the pulse decreasing device is reduced to half the number of the input pulses thereof. The gate circuit has a first, a second and a third terminal, the first terminal being directly connected to the counting device while the second terminal is connected to the pulse decreasing device which is in turn connected to the counting device.

3,609,308
DIGITAL MEASURING SYSTEMS

Stanley G. Lemon, and Charles M. Donoho, both of Annapolis, Md., assignors to Chesapeake-Instrument Corporation, Shadyside, Md.

Filed Apr. 23, 1968, Ser. No. 723,438
Int. Cl. H03k *13/02;* **G06m** *3/06;* **H03k** *21/36*
U.S. Cl. 235—92 PS **9 Claims**

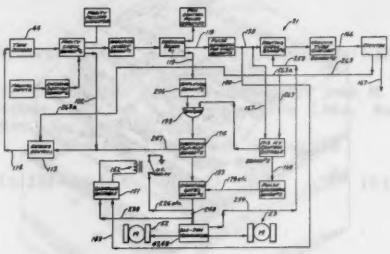


A system for determining and displaying both positive and negative speed of a rodmeter in relation to surrounding fluid is described. Depending upon whether the direction of movement of the rodmeter is forward or backward, the phase of the output of the rodmeter is either in phase with a reference signal or 180° out of phase with the reference signal. An error signal is generated between the sensed rodmeter signal and a response signal, the latter being generated by the error signal; and in order for the response signal to always be of such a phase with respect to that of the rodmeter signal so as to enable the generation of an error voltage signal proportional to the difference in amplitudes therebetween, a first reference signal is applied to a digital-to-analog converter and a second reference signal 180° therefrom is applied to a summing amplifier coupled to the output of the digital-to-analog converter. The summing amplifier output provides the response signal which changes phase by 180° whenever the phase of the rodmeter signal changes phase by 180°. Digital circuitry is also described which indicates by either analog or digital display the count registered in an up-down counter.

3,609,309
ELECTRIC PULSE COUNTER APPARATUS

Leon J. Arp, Blacksburg, Va., and Wayne C. Dowling, Sioux City, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa, by said Arp

Division of Ser. No. 637,153, May 9, 1967, Pat. No. 3,500,154.
Filed May 8, 1968, Ser. No. 727,387
Int. Cl. H03k *21/36*
U.S. Cl. 235—92 PE **5 Claims**



This invention pertains to the electrical circuitry for a counter apparatus which accepts a command number in the form of a sequence of digits in the usual manner, i.e., the most significant first, and then decrements from the command number down to zero, the circuitry comprising a plurality of cold cathode glow transfer tubes conventionally electrically connected in a left-to-right arrangement with a borrowing gate for each pair of adjacent tubes, including an inhibitor against borrowing during the loading of the tubes, only, and including further a gating distributor circuit for loading the tubes from left-to-right with the last tube loaded being the units tube, and wherein the gating circuit to the units tube is left open after loading of the counter, the circuit including a pulse generator for generating a plurality of pulses transmitted through the gating circuit to the units tube for decrementing the tubes from the command number down to zero, at which time a signal is emitted from the apparatus, using the borrowing gate for decrementing purposes.

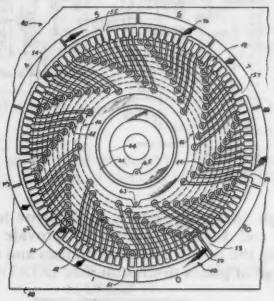
3,609,310
TIMER WITH MULTIPLE WIRE OUTPUT FOR READOUT

Louis Cetran, Newington; Gerhard A. Foerster, Woodbridge, and William P. Ryan, Bethany, all of Conn., assignors to Mite Corporation, New Haven, Conn.

Filed Mar. 28, 1969, Ser. No. 811,545
Int. Cl. H03k *21/18*
U.S. Cl. 235—92 EA **17 Claims**

A timer driven by a clock motor has a multiple wire output for readout (punched holes, displayed digits, printed digits, et.). A pawl operates a ratchet wheel having a number of teeth corresponding to a desired maximum two digit number,

and turns two rotary switches. One is a units rotary switch with a ring of short contact equaling the desired maximum number. The short contacts are in groups corresponding to 0–9, 0–9, etc., with a remainder when needed. The secondary rotary switch is a tens rotary switch having a wiper arm which is moved over a ring of long contacts each corresponding to ten short contacts, but the last long contact corresponds to the remainder, if any. The number of long contacts equals the number of groups of short contacts, and all contacts are printed on the front face of a printed circuit board. The back face of the board is printed with conductors which connect all contacts representing like digits. Because



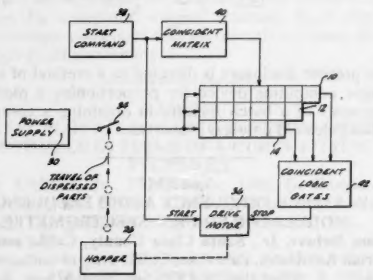
the contacts are arranged in a ring, there is an automatic reset to zero. The maximum number may be 99 for tenths and hundredths of an hour, or it may be 59 for minutes, with the clock motor output shaft turning 100 or 60 revolutions per hour respectively. The first shaft operates the pawl of a second ratchet wheel once for each revolution of the first shaft, and the second wheel has 24 teeth. A second printed circuit board has third and fourth rotary switches driven by the second ratchet wheel one revolution a day. There are contacts for a maximum of 23 followed by reset to 00. The combined maximum then is 23.99 with reset to 00.00 for a 24 hour day. For a readout in hours and minutes the maximum number is 23:59 with reset to 00:00.

3,609,311

COINCIDENT COUNTING SYSTEM

Ronald G. Wayne, Canoga Park, Calif., assignor to Centaur Mini Computer Devices Inc., New York, N.Y.

Filed May 26, 1969, Ser. No. 827,690
Int. Cl. H03k *21/36, 23/02*
U.S. Cl. 235—92 NG **6 Claims**



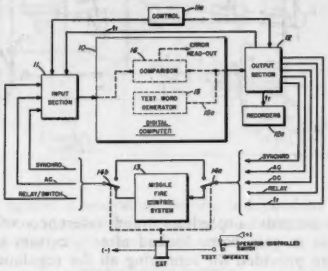
A coincident counting system is described which comprises a plurality of ring counters, each ring counter having dissimilar number of bit stages. Each initial bit stage of each ring counter is only coincident on each full cycle of operation, thereby indicating maximum count. By proper selection logic, coincidence of each bit in each register may be selected to vary the count. A single input switch increments all ring counters simultaneously until selected coincidence occurs.

3,609,312

DATA CONVERSION AND CONTROL SYSTEM

Robert K. Higgins, Silver Spring, and Andrew T. Sheets, Burtonsville, both of Md.

Filed Mar. 11, 1968, Ser. No. 712,068
Int. Cl. G06f *15/50, 11/04*
U.S. Cl. 235—150.2 **14 Claims**



A data conversion and control system comprising an input and an output section, which function to establish compatibility between an inherently analog missile fire control system or the like and a general purpose digital computer and thereby form a closed-loop, digital type fire control system. More specifically, means are provided at the input to the digital computer for converting all of the input data signals from the fire control system, regardless of their form, into a digital format acceptable by the computer and, moreover, such conversion operations are performed accurately, in reduced data conversion time. Also, means are provided at the input to the computer for making, where necessary, determinations of the algebraic sign of the input analog data signals and of the angle of input synchro data signals, for later use in the digital computer. At the output of the computer, means are provided to accept the digital outputs therefrom and convert them, where appropriate, into the various types of control signals normally associated with the missile fire control system. The present invention also provides for connecting the computer in a novel end-around test mode for the purpose of checking that both the input and output sections of the proposed data conversion and control system are operating properly. The proposed data conversion and control system of the present invention is particularly adapted for use with the fire control system for the Talos missile and provides a more accurate control of the doppler frequency guidance control signal communicated, by the fire control system, to the missile, in such a manner that there is a quicker acquisition of the target, by the missile.

3,609,313

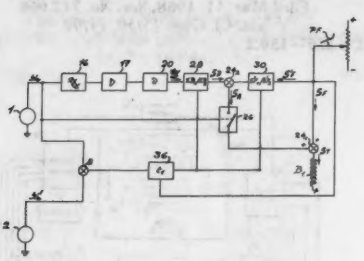
REGULATION SYSTEM FOR THE HYDRAULIC CONTROL OF BRAKING OF A VEHICLE WITH PNEUMATIC TIRES

Rene Lucien, Neuilly-sur-sein, France, assignor to Societe Anonyme dite, Messier, Paris, France

Filed Jan. 15, 1969, Ser. No. 796,636
Claims priority, application France, Jan. 16, 1968, 136,271
Int. Cl. G06g *7/70;* **B60t** *8/12*
U.S. Cl. 235—150.24 **10 Claims**

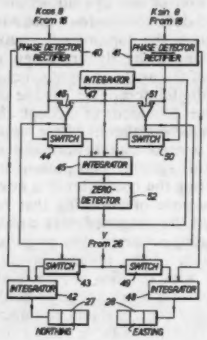
A regulation system for the hydraulic control of braking of a vehicle with pneumatic tires, comprises first, second and third regulation circuits and the slip computer, a first regulation circuit acting as a function of the deceleration of the vehicle, and of the pilot's order, the second circuit being for integral regulation with respect to a wheel slip having a predetermined reference value proportional to the pilot's order, and the third circuit being for regulation as a function of the slip, with a continuously variable gain and preferably having a parabolic form. The computer is intended to receive at its inputs the signals representing the angular speed ω of the vehicle and ω' of a braked wheel, and it multiplies their difference by the sum of a constant and a factor proportional

to ω reduced by a factor proportional to the logarithm of ω. The first or deceleration regulation circuit has two levels of gain, one for a fraction of the pilot's signal and the other for the vehicle-speed signal, these two gains being reduced when



the slip exceeds a predetermined reference value, these reductions in gain being locked after a certain time-delay. Means are provided for rendering all the regulation circuits inoperative at low running speed of the vehicle.

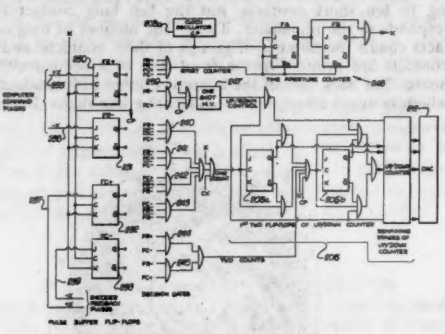
3,609,314
TIMING MEANS
Edward William Anderson, Prestbury, Cheltenham, England, assignor to Smiths Industries Limited, London, England
Division of Ser. No. 650,544, June 30, 1967, Pat. No. 3,541,853.
Filed Dec. 18, 1969, Ser. No. 886,243
Int. Cl. G01c *22/02*; **G06g** *7/78, 7/18*
U.S. Cl. 235—150.27 **6 Claims**



Timing means derives from input signals representative of K cos θ and K sin θ a signal having a period in accordance with factor K. The input signals are integrated in an integrator which also integrates in an opposite sense a voltage increasing progressively with time from an initial value. When the integral accumulated by the integrator reaches a predetermined value the said voltage is returned to its initial value. The input signals are integrated once during each progression of the said voltage for periods in accordance with respectively cos θ and sin θ so that the progressions of the said voltage vary in accordance with the factor K.

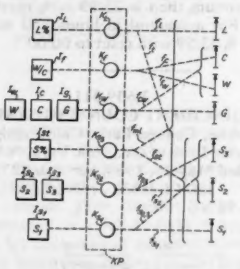
3,609,315
AUTOMATIC DRAFTING CONTROL
Waldo I. Rogers, Arcadia, Calif., assignor to California Computer Products, Inc., Anaheim, Calif.
Filed July 7, 1969, Ser. No. 839,394
Int. Cl. G05b *19/30*
U.S. Cl. 236—151.1 **8 Claims**

The invention concerns numerical control of drafting head movement in an *X–Y* coordinate system, wherein rapid and precise travel of the head to desired position, or over a range of positions, is achieved. Control apparatus is connected to be responsive to directing (input) and feedback pulses to change the count in a counter so as to control the drive of the head to desired position; and the control apparatus in-



cludes logic means responsive to timewise nearly coincident directing and feedback pulses to provide an output discriminating the nearly coincident pulses and operable to control passage of pulses to the counter.

3,609,316
COMPOSITE MIXTURE BATCHING
Noel M. H. Brosset, Le Vesinet, France, and Johan Winther, Brondersiev, Denmark, assignors to Pedershaab Maskinfabrik A/s, Brondersiev, Denmark
Filed May 23, 1967, Ser. No. 640,571
Claims priority, application France, May 24, 1966, 62732
Int. Cl. G06g *7/12*
U.S. Cl. 235—151.2 **27 Claims**

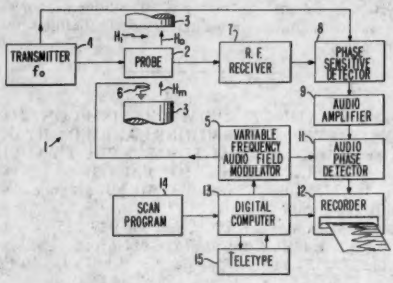


The present disclosure is directed to a method of using an analogue computing device for proportioning a plurality of components of a batch mixture in obtaining a composition exhibiting desired physical properties.

3,609,317
VARIABLE FREQUENCY AUDIO FREQUENCY MODULATOR FOR R.F. SPECTROMETER
William Siebert, Jr., Santa Clara County, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed Jan. 29, 1970, Ser. No. 6,876
Int. Cl. G01n *27/78*; **G01r** *33/08*
U.S. Cl. 235—151.3 **6 Claims**

The radio frequency spectrometer is disclosed employing a variable frequency audio frequency field modulator for producing a variable frequency sideband which can be stepped through the resonance line under analysis in precisely controlled small audio frequency increments under the control of a digital computer. The precisely controlled audio frequency for the modulator is derived from a radio frequency crystal and is divided by a certain divisor as determined by a computer which feeds the number into a counter which

serves as the divider. The quotient output of the divider is employed to trigger a square wave generator, the output of which is filtered to produce a sinusoidal audio frequency output which is fed to the field modulator. The computer calculates new divisors for each of the successive audio frequency outputs.

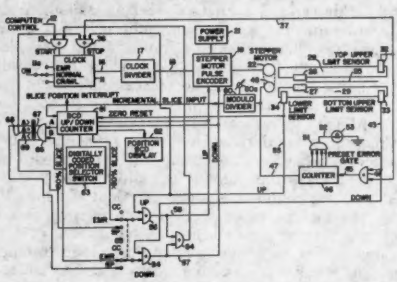


3,609,318

DIGITAL CONTROL SYSTEM FOR SCANNING SHEET MATERIAL

Eugene R. Anderson, Saratoga, Calif., assignor to Measurex Corporation, Santa Clara, Calif.

Filed Feb. 13, 1969, Ser. No. 799,066
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.3 **8 Claims**



Digital control system for scanning sheet material having provision for computer control, scanning head alignment error detection, control of scan increments, off-sheet demand and single-point positioning.

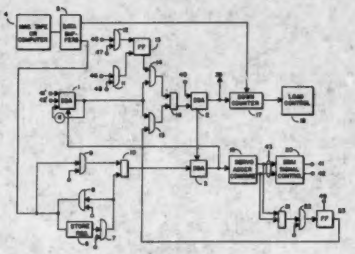
3,609,319

DIGITAL PLOTTER IN WHICH PLOTTING SPEED IS OPTIMIZED IN TERMS OF A CURVE-FITTING TECHNIQUE

William Clifford, Jr., Middletown; John G. Demko, New Shrewsbury, and William K. Kindle, West Long Branch, all of N.J., assignors to Electronic Associates, Inc., Long Branch, N.J.

Continuation-in-part of application Ser. No. 725,418, Apr. 30, 1968, now abandoned. This application Dec. 3, 1968, Ser. No. 789,632
Int. Cl. G06b *15/46*
U.S. Cl. 235—151.11 **10 Claims**

Plotting of digital data is accomplished by optimizing plotting speed in terms of a curve-fitting technique. Segments of a curve whose x and y end points are specified, are defined in terms of a set of parametric equations represented by third order polynomials with distance as the independent variable. The curvature of these segments is then developed. Optimum plotting speed is then determined considering the requisite degree of curvature and the physical limitations of the plotter such as arm and pen mass and motor torque. This optimum plotting speed determines the rate of generation of the parametric equations in x and y and drives the system through a hybrid servosystem for the independent variable distance. Thus, the plotter is driven to the desired data points with a geometry independent of velocity.

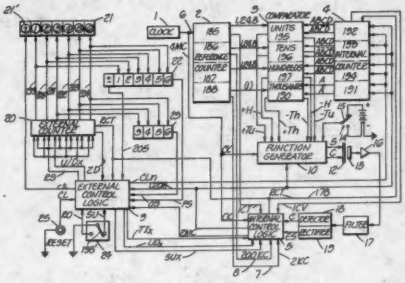


3,609,320

POSITION-MEASURING SYSTEM

Robert W. Tripp, Tuckahoe, N.Y., assignor to Inductosyn Corporation, Carson City, Nev.

Filed Mar. 24, 1969, Ser. No. 809,533
Int. Cl. G05b *19/32*; **H03k** *13/02*
U.S. Cl. 235—151.11 **30 Claims**



In a position measuring system a digital readout indicates the position of a movable machine member relative to a reference zero on a workpiece attached to the other machine member. The system uses a measuring device having a plurality of equally spaced measuring cycles. A reference position in these cycles herein is designated as sine zero, the workpiece reference position being offset by an amount Δ from one of these sine zero's. The contents of an internal counter controlled by the measuring device represent the position of the movable member between two adjacent sine zero's. An external counter and display indicate the actual position of the movable member with respect to the part zero.

3,609,321

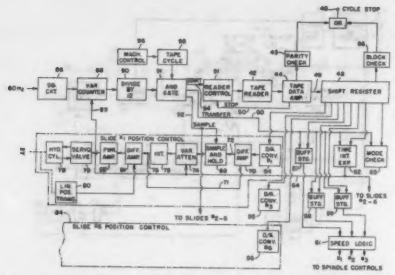
TAPE INPUT CONTROL SYSTEM FOR MACHINE TOOL

Richard Hood Campbell, Jr., Gilford, N.H., assignor to Pneumo Dynamics Corporation, Cleveland, Ohio

Filed Apr. 8, 1969, Ser. No. 814,350
Int. Cl. G06f *15/46*, *15/20*; **G06g** *7/48*
U.S. Cl. 235—151.11 **14 Claims**

A control system for a multiple-spindle automatic machine having a plurality of reciprocable tool-bearing slides which are simultaneously operable, wherein seriate position information for each slide, contained on a preprogrammed tape, is converted to continuous signals for control of position loop servos which actuate the slides. Sample and hold circuits receive discrete difference position information and maintain

same for application to integrator circuits which develop the continuous control signals. Introduction of input information occurs on a variable time basis dependent upon the programmed operating characteristics of the integrator circuits



which in turn provide the variations of the control signals and thus control the rates of movement of the slides. Integrated circuit and solid state component technology is utilized throughout the control system which features a unique sample and hold circuit.

3,609,322

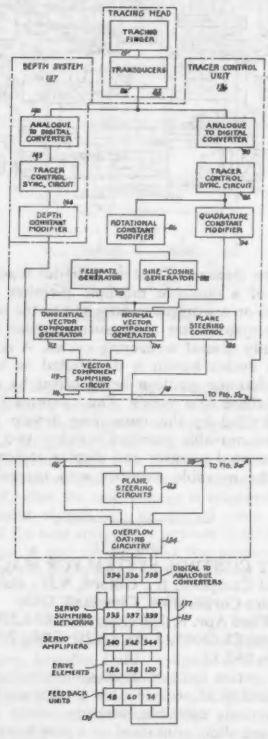
DIGITAL TRACER CONTROL

Lonnie A. Burnett; Norman D. Neal; George L. Wissel, and Harold D. Wiebe, all of Cincinnati, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 17, 1969, Ser. No. 824,344

Int. Cl. B23q *35/12;* **G06f** *15/46*

U.S. Cl. 235—151.11 **9 Claims**



A digital tracer control responsive to inputs from a tracing head for controlling servomechanism inputs of a machine.

From the tracing transducers, the system immediately converts the analogue tracing signal into a digital representation. Through the use of digital differential analyzers or modifications thereof, output pulse rates are obtained analogous to tracer error and suitable for use in machine servosystems. The system is capable of tracing a three-dimensional model in any plane within a coordinate system defined by the machine axes.

3,609,323

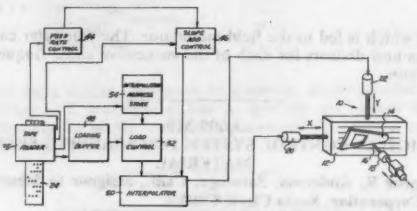
INTERPOLATING SERVOMECHANISM CONTROL SYSTEM WITH OPERATIONS CARRIED OUT IN BINARY CODED DECIMAL FORMAT DUE TO A "PLUS-SIX" CORRECTION FACTOR

George H. McDaniel, Northville, Mich., assignor to The Bendix Corporation

Filed May 23, 1969, Ser. No. 827,285

Int. Cl. G05b *19/18;* **G06f** *15/46*

U.S. Cl. 235—151.11 **9 Claims**



An electronic position control system for use for controlling continuous path machining operations wherein a cutting tool is moved relatively to a workpiece along a path which depends on the component motions of the servomechanisms moving the cutting tool and the workpiece relatively to each other. The individual servomechanisms displacing the cutting tool and the workpiece relatively to each other along each axis are adapted to be actuated by a controller according to the number of pulses received at their input, and the pulses are derived from input numerical data in binary coded decimal form indicating the increments of motion to the final relative position of the cutting tool, such numerical data being continually added one digit at a time to a remainder and each pulse supplied to one servomechanism being the result from the overflow of such addition. Each time a carry occurs, or a sum greater than nine is obtained for a digit, the number six is automatically added to the addition remainder to provide an arithmetically correct sum in binary coded decimal form which is stored in the remainder register for further addition with the integrand until an appropriate number of pulses in each train is supplied at the output of the controller.

3,609,324

METHOD AND APPARATUS FOR MEASURING THE PURITY RATIO OF INTERMEDIATE PRODUCTS IN SUGAR MANUFACTURE

Meinrad Machler, Ellwangen, and Horst Loffler, Oberkochen, both of Germany, assignors to Carl Zeiss-Stiftung, Heidenheim on Brenz, Wurrtemberg, Germany

Filed Feb. 5, 1969, Ser. No. 796,782

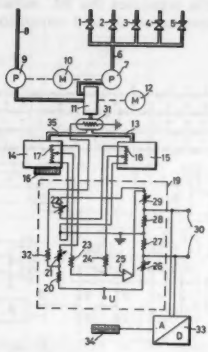
Claims priority, application Germany, Feb. 10, 1968, P 16 98 292.6

Int. Cl. G01n *21/00, 21/40*

U.S. Cl. 235—151.35 **17 Claims**

The proportion of sucrose in the whole of the dissolved substances of intermediate products in sugar manufacture is measured by: measuring the refractive index n of a sample of an intermediate product, measuring the polarimetric rotation α of the same sample and then combining these measurements in the relationship $\alpha/n-n_o$ to produce a "purity quotient" (n_o being the refractive index of pure water.) The numerical value of this quotient varies with the temperature of the sample. Therefore the temperature of the sample is maintained constant within a certain range and an additional temperature correction is effected. In a preferred form of ap-

paratus for performing the measuring method, the resultant of the calculation of the quotient is reproduced in both analog and digital form respectively for controlling automatic process control computers and for actuating a device for indicating the measurements in visible form.

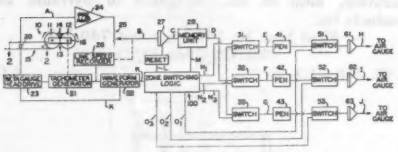


3,609,325

SYNCHRONIZED AVERAGING SYSTEM FOR BETA GAUGE CONTROL OF CALENDER SYSTEMS

John R. McCarty, Akron, and John A. Guldan, Hudson, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 29, 1969, Ser. No. 829,043
Int. Cl. G05d 5/02; G06g 7/18
U.S. Cl. 235—151.35 **16 Claims**



A system for electronically controlling a physical characteristic of the output sheet material of a calender. A beta gauge is moved laterally across the width of the output sheet at a rate synchronous with the line speed of the calender, and performs average error computations in a plurality of zones of the sheet. The beta gauge error signal, indicating any deviation in the physical characteristic, may actuate a control system to compensate for the error and can induce movement of a recording pen for visual monitoring.

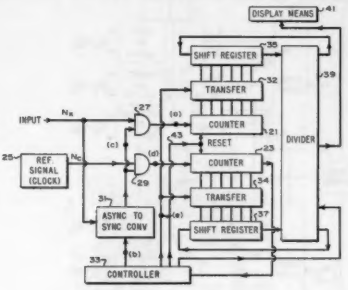
3,609,326

COUNTING APPARATUS AND METHOD USING SEPARATE COUNTERS FOR REFERENCE AND UNKNOWN SIGNAL

Alan S. Bagley, Los Altos Hills, and France Rode, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 22, 1969, Ser. No. 793,114
Int. Cl. G01r 23/10
U.S. Cl. 235—152 **3 Claims**

Improved apparatus and method for determining the rate of recurrence of input events involves counting recurring input events and recurring reference events for a period of time that is determined by the desired length of measurement period, and the timing of the input events. The desired output indication of recurrence rate of input events is provided by arithmetically dividing the arbitrary number of input events occurring within the measurement period by the arbitrary number of reference events occurring within the same measurement period.

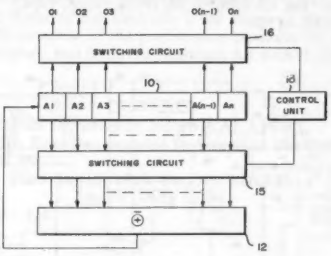


3,609,327

FEEDBACK SHIFT REGISTER WITH STATES DECOMPOSED INTO CYCLES OF EQUAL LENGTH

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Marvin Perlman, Granada Hill, Calif.

Filed Oct. 22, 1969, Ser. No. 868,529
Int. Cl. H03k 1/00; G06f 11/00
U.S. Cl. 235—152 **9 Claims**



A feedback shift register (FSR) comprising a shift register of n stages, with the outputs of selected stages being mod-2 added in a feedback unit. The complement of the unit is fed back to the register's input stage. The number of outputs, which are fed back, is always odd, equaling a number which is one less than 2, raised to a number representing the number of 1's in the binary representation of n. The actual stages which are fed back are defined by the exponents of the terms X in the expansion of the term $(X+1)^n$. Such an FSR produces disjointed multistate cycles, each of a length 2^i, where

$$2^i - 1 < n + 1 < 2^i.$$

If n is other than a power of 2, complementary states appear in different cycles. However, if n is a power of 2, complementary states appear 180° apart in the same cycle.

3,609,328

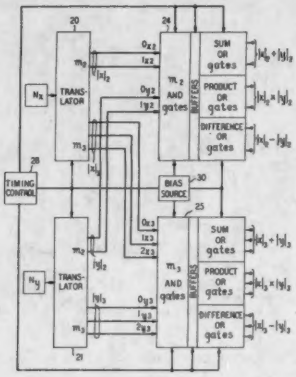
MULTIAPERTURE FERRITE RESIDUE ARITHMETIC UNIT

Robert B. Kieburtz, Fair Haven, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 19, 1968, Ser. No. 785,291
Int. Cl. G06f 7/48; G11c 11/08, 5/08
U.S. Cl. 235—156 **8 Claims**

A residue arithmetic unit is developed from multiaperature ferrite structure logic gates. Each gate is an assembly of windings on a separate aperture of a multiaperture ferrite structure. The gates are interconnected so that groups of information pulses representing two input residue numbers are

applied to and are stepped through the gates in response to clock pulses, which also impart amplification to the information pulses. Output pulses represent the results of residue arithmetic operations performed on the input numbers.

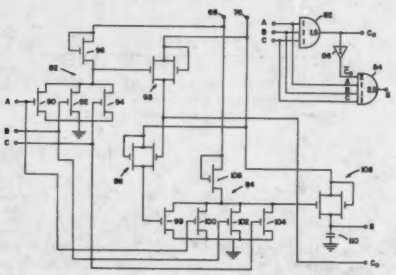


3,609,329

THRESHOLD LOGIC FOR INTEGRATED FULL ADDER AND THE LIKE

Harold M. Martin, South Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed May 5, 1969, Ser. No. 821,756
Int. Cl. G06f *7/50;* **H03k** *19/08, 19/42*
U.S. Cl. 235—176 **16 Claims**



Threshold logic functions are carried out by the use of an insulated-gate field effect transistor (IGFET) connected as a sampler transistor in series with a not-clock input and a parallel combination of several data input IGFET's. The sampler transistor and the data input transistor combination form a voltage divider whose center tap is connected to the input of an IGFET inverter operated from a clock input. By using data input IGFET's with different "on" resistances, the data inputs can be selectively weighted, and a full adder circuit can be constructed with only 15 components, all of which are IGFET's, and all of which can be manufactured on a single chip.

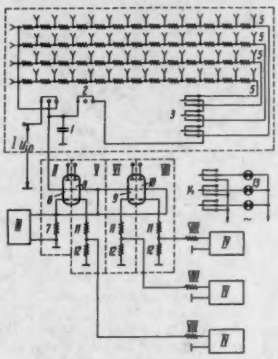
3,609,330

SIMULATION DEVICE FOR CALCULATION OF WATER DISCHARGE AND LEVELS IN RIVER AND CANAL BEDS AT TRANSIENT FLOWS

Anatoly Nikolaevich Volosevich, Moscow, U.S.S.R., assignor to Nauchno-Issledovatelsky Institut Gidrometeorologicheskogo Priborostroinia, ulitsa Razina, Moscow, U.S.S.R.

Filed June 17, 1968, Ser. No. 737,671
Int. Cl. G06g *7/57*
U.S. Cl. 235—184 **3 Claims**

A simulating device for calculating water discharge and levels in river and canal beds at transient flows, comprises at least one threshold-setting device and at least two RC networks. Each of the RC networks includes a capacitor and at least two resistors connected to the capacitor via contact groups of the relay of the threshold device. A basic decoupling module separates the RC networks by means of its input being connected to said capacitor of the first RC network and by its output being connected to the input of the other RC network. The time constants of the RC networks are changed at certain voltages by connecting another resistor of the same network to the capacitor through the contact groups of the threshold-setting device. An additional decoupling module is connected to the basic decoupling module and to the input of the threshold-setting device.

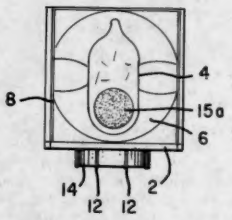


3,609,331

PHOTOFLASH LAMP

William C. Fink, Williamsport, and John W. Shaffer, Montoursville, both of Pa., assignors to Sylvania Electric Products Inc.

Filed June 26, 1968, Ser. No. 740,242
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **6 Claims**



A flashcube in which readily visible indicators are provided for identifying a flashed lamp. The indicator material is responsive to the heat generated by the flashlamp to thereby be deposited on the window of the flashcube and define a noticeable colored area thereon.

3,609,332

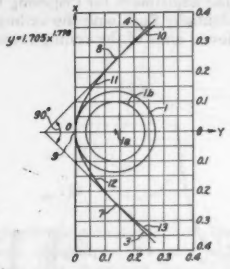
PHOTOFLASH LAMP ARRAY WITH REFLECTOR-LAMP MODULE

Donald R. Schindler, Burton, Ohio, assignor to General Electric Company

Filed Dec. 16, 1968, Ser. No. 784,066
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **7 Claims**

A photoflash lamp-reflector module for use in a photoflash array for providing optimum optics in a minimum of space where the light source is comparatively large relative to the reflector surface. The module consists of a reflector with a

parabolic-type surface for essentially its entire effective reflecting area and a tubular photoflash lamp positioned in the innermost part of the reflector transversely of the axis thereof with the reflector essentially tangent to the lamp. The



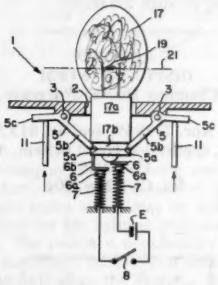
reflector has an angle relative to its optical axis in the direction of light projection of approximately 45° at a point on that portion of the reflector which is adjacent the centerline of the lamp and extends forwardly of the lamp axis.

3,609,333

FLASHBULB HOLDER FOR PHOTOGRAPHIC FLASHGUNS

Masahiko Iwaki, Fujisawa-shi, and Hazime Kogawa, Tokyo, both of Japan, assignors to Honeywell Inc.

Filed Feb. 26, 1969, Ser. No. 802,545
Claims priority, application Japan, Mar. 11, 1968, 43/15756
Int. Cl. H01r *13/62*
U.S. Cl. 240—1.3 **3 Claims**



A flashbulb holder for a photographic flashgun is shown having a housing with an opening into which various-sized flashbulbs are inserted between a pair of pivoted holding members mounted on opposite sides of the opening. A pair of base contact members engage the flashbulbs, as they are inserted between the holding members, for urging the bases of the flashbulbs against the inner edges of the holding members. A potential source connects to the base members for selectively energizing the flashbulbs.

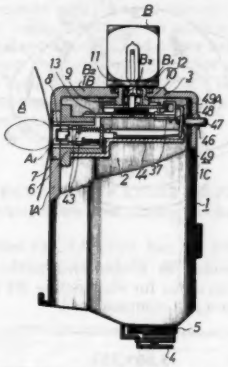
3,609,334

MOUNTING MEANS FOR VARIOUS FLASHBULBS AND FLASHCUBES WITHIN A PHOTOGRAPHIC FLASHGUN

Masahiko Iwaki, Fujiswa-shi, Japan, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 22, 1969, Ser. No. 859,893
Claims priority, application Japan, Sept. 21, 1968, 68354/68
Int. Cl. G03b *15/02*
U.S. Cl. 240—1.3 **4 Claims**

A flashgun for mounting various flashbulbs and flashcubes is shown having a housing with a first socket into which the flashcube is inserted. A resiliently mounted U-shaped locking member yields as the flashcube is inserted between the pawled arms thereof for locking the flashcube against the urging of an ejection spring within the socket. Depression of a pushbutton contacts the resiliently mounted locking member and frees the flashcube for ejecting it from the socket. A second socket is provided into which various-sized flashbulbs are inserted between a pair of pivoted holding



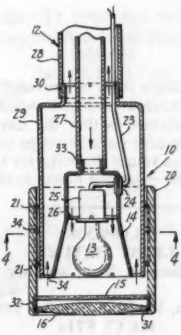
members mounted on opposite sides of the socket. A pair of base contact members engage the flashbulbs, for urging the base of the flashbulbs against the inner edges of the holding members. Depression of the pushbutton contacts the pivoted holding members and frees the flashbulb for socket ejection.

3,609,335

HIGH INTENSITY SURGICAL LIGHT

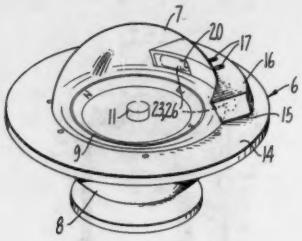
Paul M. Kelly, Erie, Pa., assignor to American Sterilizer Company, Erie, Pa.

Filed Aug. 8, 1969, Ser. No. 848,435
Int. Cl. A61g *13/00*
U.S. Cl. 240—1.4 **11 Claims**



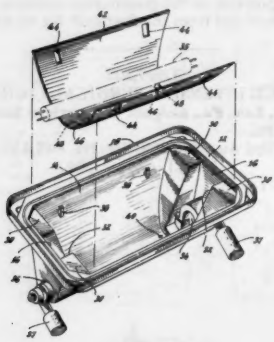
A surgical light capable of being positioned in close proximity to an operating site. The light is made up of a high intensity bulb, a lens, a filter, and a lens holder, in combination with a cooling means for the high intensity light. A part of the light may be removed from sterilizing.

3,609,336
COMPASS LIGHT
Albert Coppola, Scarboro, Maine, assignor to The Eastern Company
Filed Apr. 22, 1970, Ser. No. 30,904
Int. Cl. G01d 11/28
U.S. Cl. 240—2.1 2 Claims



Means are provided in cooperative association with a transparent compass dome for illuminating the compass card mounted for rotation in a compass bowl.

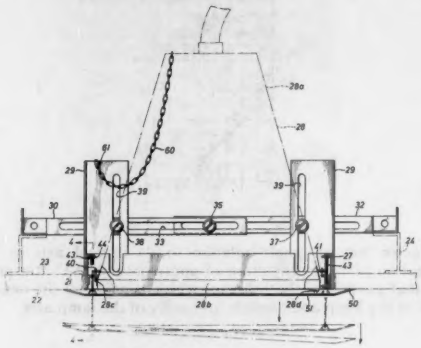
3,609,337
FLOODLIGHT REFLECTOR-RETAINING MEANS
Tarek Adra, La Canada, and Robert P. Draper, Burbank, both of Calif., assignors to Harvey Hubbell, Incorporated, Bridgeport, Conn.
Filed Sept. 20, 1968, Ser. No. 761,113
Int. Cl. F21p 5/00
U.S. Cl. 240—3 9 Claims



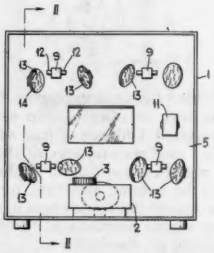
A cast metal floodlight body is provided with an arcuate cavity and integral internal reflector-mounting hooks. The reflector trough positioned within the cavity is a resilient sheet having slots adjacent parallel edges to receive the cast hooks. Securing screws retain the reflector trough in position and cooperate with the mounting hooks to shape it.

3,609,338
LIGHT FIXTURE
Robert M. Kripp, Houston, Tex., assignor to Esquire, Inc., New York, N.Y.
Filed Sept. 18, 1968, Ser. No. 760,566
Int. Cl. F21s
U.S. Cl. 240—9 27 Claims

A light fixture assembly including an open-ended frame adapted to be disposed within a recess in a ceiling and a light fixture whose lower light-transmitting end is adapted to be received in the frame. A pair of extendible and retractable bars are mounted on the frame and extend generally horizontally along opposite sides thereof for supporting the frame from the ceiling when it is so disposed therein. A means is provided for adjusting the elevation of each bar relative to its adjacent side of the frame, and thus the elevation of the lower end of the frame relative to the lower end of the ceiling recess. The light fixture is supported from the frame, when it is so received therein, by means of rails extending along and connected to opposite sides of the frame by leveling screws which provide a fine adjustment for disposing the lower end of the fixture substantially flush with the ceiling. The separation between the lower ends of the ceiling recess and the fixture is normally covered by a trim plate which is suspended from the frame in such a manner that it may be lowered and then moved to a position permitting access to a light-transmitting window across the lower end of the housing, whereby the window may be moved to a position permitting relamping and the like within the fixture housing. The upper end of the fixture housing is narrower in its lower end so that it may be lifted above the supporting rails on the frame and tilted to a position for passing through the frame.



3,609,339
DISPLAY SYSTEM
Victor S. Smith, Channing House, Wargrave, Berkshire, England
Filed Apr. 7, 1969, Ser. No. 813,953
Claims priority, application Great Britain, Apr. 10, 1968, 17410/68
Int. Cl. F21p 5/04
U.S. Cl. 240—3.1 3 Claims

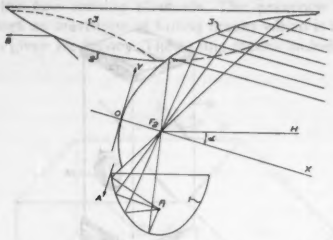


A stationary light source projects light onto a translucent screen via two laterally spaced rotating reflectors, each having a reflective surface of crinkled metallized plastic.

3,609,340
IMPROVEMENTS IN LIGHTING UNITS
Lars Bertil Habro, Lidingo, Sweden, assignor to AB Vagbellysning, Stockholm, Sweden
Filed Apr. 17, 1969, Ser. No. 816,963
Claims priority, application Sweden, Apr. 23, 1968, 5396/68
Int. Cl. F21m 3/04
U.S. Cl. 240—41.1 3 Claims

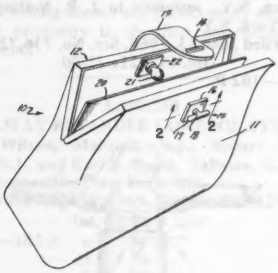
A lighting unit consists of an elliptic rotational reflector having the light source positioned in one focal point, and a

convex reflector facing the elliptic rotational reflector and serving for polydirectionally radiating the light rays which are emitted by the light source and pass through the other focal



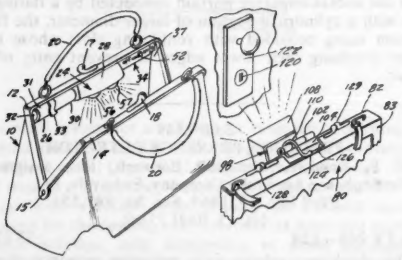
point of the elliptic rotational reflector. The convex reflector has at least one cup-shaped inwardly bulging recess which reflects the light rays impinging thereon at least essentially parallel.

3,609,341
ILLUMINATED HANDBAG
Stanley C. Castaldo, 704 North Lake Pleasant Road, Apopka, Fla.
Filed Jan. 14, 1970, Ser. No. 2,793
Int. Cl. A45c 15/06
U.S. Cl. 240—6.45 P 7 Claims



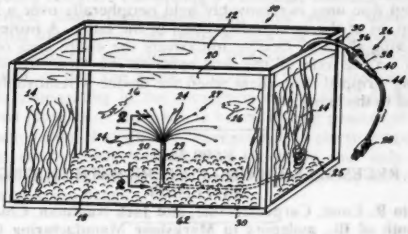
A ladies' handbag apparatus having inside compartments which may be illuminated by an electrical light circuit having a plurality of light bulbs which may be selectively or simultaneously switched on for lighting individual compartments of the handbag. The switch is actuated by a rotatable clasp for latching the handbag closed so that the lights in the handbag will be turned off when the bag is in its normally closed position and turned on when the clasp is rotated to its normally open position for the handbag.

3,609,342
LIGHT FOR LADIES HANDBAG
Maria Wisniewski, 819 68th St., Brooklyn, N.Y.
Filed Dec. 10, 1969, Ser. No. 883,753
Int. Cl. A45c 15/06
U.S. Cl. 240—6.45 P 3 Claims



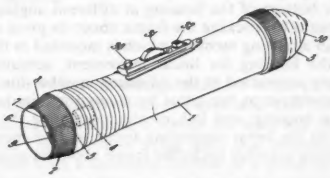
A lighting unit for placement in a ladies handbag embodying a support structure that carries a battery, a light bulb housing and an off-on switch. The entire unit is self-contained and is secured within the handbag adjacent one of the upper open ends thereof so as to be readily accessible for replacement of the battery and/or the light bulb and which will in no way interfere with the normal contents contained within the handbag. With the switch in "on" position the light from the light bulb housing will be directed into the interior of the handbag to illuminate the same. The light bulb housing may either be integral with the support structure or made as a separate entity hinged thereto and formed to be swung from it inside position to an outside position over and across the adjacent top open end of the handbag should it be desired to direct the light on an exterior object such as the key-receiving opening of a door lock. The conductors connecting the battery, light bulb and switch are all contained within the support structure.

3,609,343
DECORATIVE LIGHT DISPLAY
Mark K. Howlett, Santa Ana, Calif., assignor to Poly-Optics, Inc.
Filed Feb. 13, 1969, Ser. No. 805,971
Int. Cl. F21s 5/00; A47q 33/06
U.S. Cl. 240—10 10 Claims



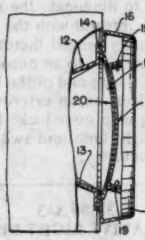
A light display for use within a fishtank or the like for decorative or lighting purposes, the tank having a viewing area sufficiently translucent to allow a view therethrough of its contents, wherein there are provided a plurality of optical fibers with their light-emitting end faces toward the viewing area. A light source is positioned adjacent the opposite ends of the fibers and an opaque sheath is provided extending from the light source to the directing means.

3,609,344
FLASHLIGHT WITH INDEPENDENT BLINKER
Pak Hung So, Hong Kong, assignor to Honour Metal Manufacturing Co. Limited, Shamshuipo, Kowloon, Hong Kong
Filed Mar. 17, 1969, Ser. No. 807,741
Claims priority, application Great Britain, Mar. 18, 1968, 13058/68
Int. Cl. F21l 7/00
U.S. Cl. 240—10.66 1 Claim



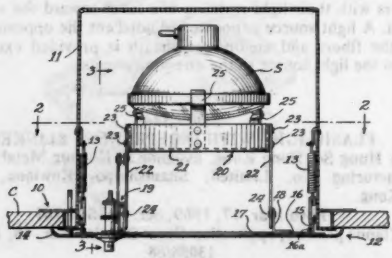
An electric flashlight having independently operable continuous and blinker bulbs mounted at opposite ends of a tubular barrel. A contact assembly is removably located at one end of the barrel and has two coaxially arranged contact elements. The first contact element rests on the edge of the barrel and a blinker bulb electrically connects the first contact element to the second contact element. Two separate switches are mounted for controlling the bulbs.

3,609,345
DISPOSABLE FOG LENS FOR LAMPS
Alvin H. Perkiss, 21705 Snow, Dearborn, Mich.
Filed Oct. 14, 1968, Ser. No. 767,372
Int. Cl. F21v *17/04, 9/00, 13/04*
U.S. Cl. 240—46.19 1 Claim



A disposable fog lens for automobile head lamps is constituted by a circular disc of flexible-transparent or translucent sheet material, tinted in amber and backed by a tacky-coated, transparent flexible mounting sheet, by which the tinted disc area is removably held peripherally over a head lamp, as at the surrounding bezel of the latter. A protective masking sheet of flexible foil covers the entire area of the unit on the side of the disc opposite the mounting sheet, being stripped from them when the device is removably applied to the lamp.

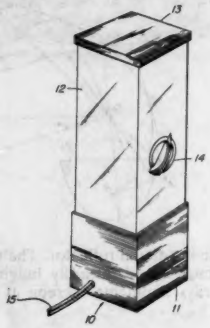
3,609,346
RECESSED LIGHTING FIXTURE WITH TILTING SPOTLIGHT
Alvin R. Lund, Carpentersville, and Jack Kaufman, Chicago, both of Ill., assignors to Markstone Manufacturing Company
Filed Apr. 29, 1969, Ser. No. 820,100
Int. Cl. F21s *1/06*
U.S. Cl. 240—78 HA 11 Claims



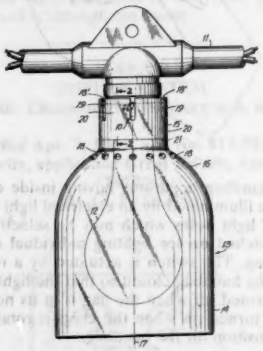
A recessed lighting fixture of the type in which a lamp support frame is mounted in a housing on a horizontal pivot axis for directing light from a lamp in the frame through an opening in the bottom of the housing at different angles, with adjusting means for rocking the frame about its pivot axis in the form of an adjusting member which is mounted in the bottom part of the housing for linear movement, actuating means operatively connected to the adjusting member for imparting linear movement to the latter by manual manipulation from below the housing, and link means connecting the adjusting member to the lamp supporting frame so that movement of the adjusting member rocks the frame about its pivot axis.

3,609,347
NYCTOPHOBIA LAMP
David A. Kopenhaver, P.O. Box 1, Deal, N.J.
Filed Aug. 1, 1968, Ser. No. 749,440
Int. Cl. F21s *1/12*
U.S. Cl. 240—81 R 6 Claims

This application discloses a lamp mounted within a translucent shade and connected to a mechanically operated rheostat which automatically to a predetermined minimum wattage, a timer is directly connected to the rheostat and manually settable to a desired position. As the timer runs down, the rheostat is rotated, thereby diminishing the wattage supplied to the bulb.



3,609,348
GUARD FOR ELECTRIC LIGHT BULBS
Anthony D. Marasco, Norwalk, Conn., and Paul C. Savoca, Massepequa, N.Y., assignors to J. B. Nottingham & Co., Inc., New York, N.Y.
Filed June 13, 1968, Ser. No. 736,720
Int. Cl. F21v *15/00*
U.S. Cl. 240—102 R 1 Claim

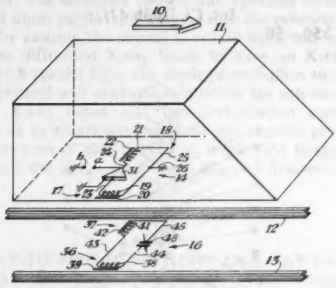


A lamp guard made of transparent or translucent rigid resin, and is continuous in form, is made capable of being snapped over a socket to enable an inwardly extending bead to pass behind an edge of the socket, by being open slotted at a number of points in its circumference at its reduced socket-engaging end, the guard being approximately bell shaped with the socket-engaging portion connected by a flaring section with a cylindrical portion of larger diameter, the flaring portion being provided with ventilating slots whose upper edges overhang their lower edges to prevent entry of rain water.

3,609,349
PRECISION PRESENCE DETECTOR
Emil F. Brinker, Churchill Borough, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.
Filed Dec. 23, 1969, Ser. No. 887,551
Int. Cl. B61l *25/02*
U.S. Cl. 246—124 15 Claims

This disclosure relates to a precision presence detector having an oscillating amplifying means which is normally in a nonoscillating condition. The oscillating means includes a

first and a second inductive sensing element which are positioned in a predetermined relationship with each other so that essentially zero magnetic coupling normally exists between the two sensing elements. The presence detector also employs an inert type of tuning means which is normally tuned to a given frequency. The tuning means includes a first



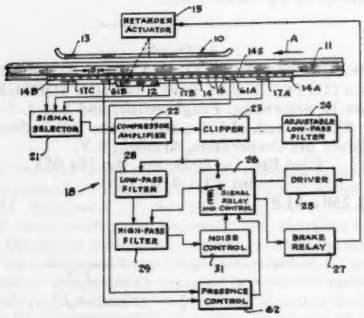
and a second tuned inductive element which are spaced in the same predetermined relationship as the inductive sensing elements. Thus, the oscillating amplifying means will begin oscillating whenever the first and second tuned inductive elements of the tuning means are substantially directly aligned with and in proximity to the first and second inductive sensing elements.

3,609,350

RAILWAY RETARDER CONTROL SYSTEM

Rosser L. Wilson, Mahwah, N.J.; Robert W. Convey, Oakland, N.J., and Earl E. Frank, Tallman, N.Y., assignors to Abex Corporation, New York, N.Y.

Filed Aug. 26, 1969, Ser. No. 853,129
Int. Cl. B61l *1/04*
U.S. Cl. 246—182 A **9 Claims**



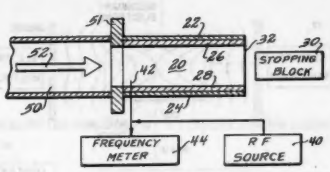
A control system for a railway car retarder comprising an elongated notched sensing rail engaged by an overhanging part of a car wheel (the wheel flange or the outer edge of the wheel tread), with a control that determines car speed in accordance with vibration of the sensing rail. Resilient mounting is used for the sensing rail, to minimize wear and provide vibration isolation, with dampening to avoid mechanical resonance at frequencies in the operating speed range. A separate car presence detector, actuated by the sensing rail, is included.

3,609,351

TRAVELING WAVE PARTICLE SEPARATOR INCLUDING A RECTANGULAR WAVEGUIDE LINED WITH A DIELECTRIC MATERIAL

John W. Dawson, Clarendon Hills, and Robert L. Kustom, Oak Lawn, both of Ill.

Filed July 2, 1969, Ser. No. 838,433
Int. Cl. H01j *39/36*
U.S. Cl. 250—41.9 DS **5 Claims**



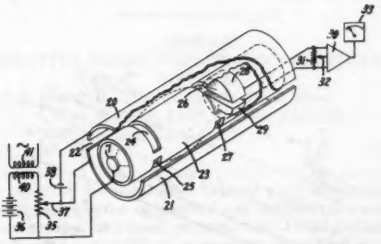
A tunable RF power source is connected to a particle deflecting structure comprising a waveguide mounted to pass a particle beam therethrough and lined with a dielectric material for reducing the phase velocity of electromagnetic waves within the waveguide. The frequency of the RF source is tuned so that the phase velocity of the electromagnetic waves propagating in the waveguide equals the velocity of desired particles in the particle beam. During passage of the particle beam through the waveguide the electromagnetic waves continuously interact with the beam, but only the desired particles receive a net deflection relative to the other particles in the beam.

3,609,352

SECONDARY ELECTRON ENERGY ANALYZING APPARATUS

Lawrence A. Harris, Schenectady, N.Y., assignor to General Electric Company

Filed May 18, 1970, Ser. No. 37,967
Int. Cl. H01j *37/00*; **G01n** *23/00*
U.S. Cl. 250—49.5 AE **8 Claims**



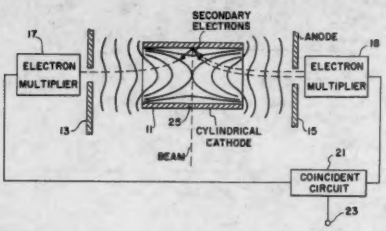
A secondary electron energy analyzer employs a pair of spaced coaxial cylinders with entrance and exit slots in the inner cylinder, the distance between the slots and the potential between the cylinders being such that secondary electrons emitted from a specimen located at a point on the axis of the cylinders enter the space between the cylinders at the entrance slot and are focused at the exit slot. An electron multiplier is located within the inner cylinder to receive the focused electrons. The outer cylinder may be split into two portions, each with its individual slots and operated at slightly different potentials, so that electrons of different energies are focused at the two exit slots, measurement of the difference in the outputs from the two portions yielding the derivative of the energy distribution curve of secondary electrons.

3,609,353

COINCIDENCE APPARATUS FOR DETECTING PARTICLES

T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration in respect to an invention of, and Frederick A. White, Schenectady, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,364
Int. Cl. G01t 1/16
U.S. Cl. 250—49.5 9 Claims



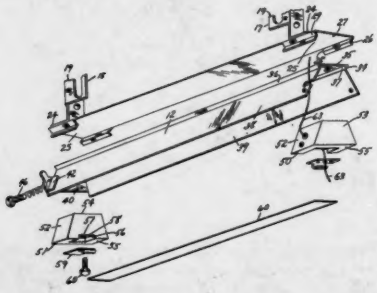
This disclosure describes an apparatus for detecting particles. Particles, depending on their nature, pass through either an aperture in or the walls of a cylindrical cathode. The particles create secondary emissions when they impinge on the opposite side of the cathode from their point of entry. The secondary emissions pass out the ends of the cylindrical cathode, through apertures in anodes, and impinge on the electrodes or dynodes of electron multiplier tubes located adjacent to the apertures in the anodes. The output of the electron multiplier tubes are connected to a coincidence circuit. Due to the symmetry of the overall system, an equal number of secondary emissions are focused by an electrostatic field and impinge on each electron multiplier tube; hence, emissions lower than the noise level of a single electron multiplier tube can be detected.

3,609,354

CORONA ASSEMBLY FOR ELECTROSTATIC COPY MACHINES

David L. Herman, 63 Catherine Road, Scarsdale, N.Y.

Filed June 18, 1969, Ser. No. 834,336
Int. Cl. G03g 13/00
U.S. Cl. 250—49.52 C 1 Claim



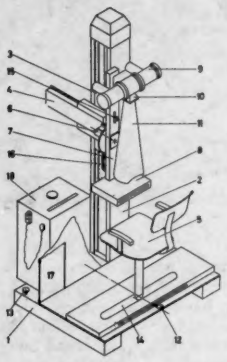
A corona assembly for use with electrostatic copy machines, including a fixed bracket element of generally trapezoidal shape, a shield element having a first portion of corresponding configuration slideably engageable therewith, a corona wire of generally rectilinear configuration, a pair of planer diverging walls surrounding said corona wire, a pair of end blocks supported by said diverging walls at the end portions thereof, and supporting said wire at each of two terminals thereof, said diverging walls allowing ionized air disposed therebetween to readily escape to reduce the possibility of arcing.

3,609,355

X-RAY MAMMOGRAPH IN WHICH THE X-RAY SOURCE AND FILM CASSETTE ARE ROTATABLE ABOUT THE SUBJECT BEING PHOTOGRAPH

Kurt Schwarzer, Spardorf Uber Erlangen, Germany, assignor to Schick X-Ray Co., Inc., Wilmette, Ill.

Filed May 12, 1969, Ser. No. 823,845
Claims priority, application Germany, May 31, 1968, H 62 892
Int. Cl. G03b 41/16
U.S. Cl. 250—50 6 Claims



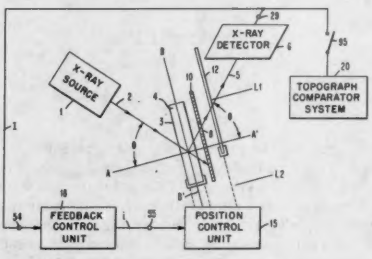
The X-ray apparatus is especially well adapted for taking mammograms; that is, X-ray pictures of the female breast. A single upright supporting column and a patient chair are mounted on a platform. The column supports a counterbalanced vertically movable member which in turn supports a horizontally movable arm. A head is adjustably rotatable about the horizontal axis of the arm. An X-ray source and a cassette carrier are mounted on opposite portions of the head. The arm is movable horizontally toward and away from the front of the chair, which is movable horizontally along the platform at right angles to the movement of the arm. The X-ray source is preferably movable along the head, toward and away from the cassette carrier for making mammograms in which the breast is compressed. A control console is preferably mounted on the platform and is screened from the X-ray source by a protective wall.

3,609,356

FEEDBACK CONTROLLED SCANNING MICROSCOPY APPARATUS FOR X-RAY DIFFRACTION TOPOGRAPHY

Guenther H. Schwuttke, Poughkeepsie, and Leo J. Van Mellaert, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 16, 1968, Ser. No. 784,052
Int. Cl. G01n 23/20
U.S. Cl. 250—51.5 14 Claims



Disclosed is apparatus for forming topographs of large crystalline areas using X-ray diffraction microscopy

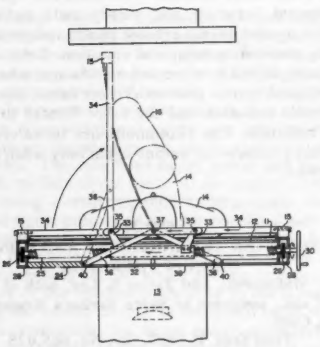
techniques. The apparatus includes an X-ray source which directs an X-ray beam at a crystal which is mounted on a position control unit. The position control unit includes a scanning goniometer for translating the crystal and a low friction device for rotating the crystal both with respect to the incident X-ray beam. A beam detector is positioned to detect a diffracted beam as it leaves the crystal. The X-ray detector is connected to the position control unit through a feedback control unit. The feedback control unit operates by introducing a small input perturbation signal into the position control unit thereby causing the crystal to rotate back and forth and causing the diffracted X-ray beam to have an X-ray component which results from the input perturbation signal. The feedback control unit operates to monitor the intensity of the diffracted X-ray beam and the perturbation component thereof so as to adjust automatically the angular position of the position control unit toward an angle (the Bragg angle) which causes the X-ray detector to detect a maximum intensity.

3,609,357

PATIENT-TILTING DEVICE FOR AN X-RAY TABLE

William E. M. Jones, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 29, 1969, Ser. No. 820,089
Int. Cl. G01n *23/00*
U.S. Cl. 250—55 **7 Claims**



Described is an improved device for use atop such as an X-ray examination table to tilt the supine patient about an axis extending lengthwise of the table top. A thin, flexible, semistiff, X-ray-transparent, normally flat, sheetlike member accepts the supine patient thereon and overlies the table top for support. Elongated rigid lift rods attached to opposite side edges of the sheetlike member provide for vertical actuation thereof. Actuating mechanisms at opposite ends of the rods provides for selective degrees of raising of one lift rod while translating the other rod laterally inward along the table top. The sheetlike member and side rods are removable as a unit to act as a patient carrier if desired.

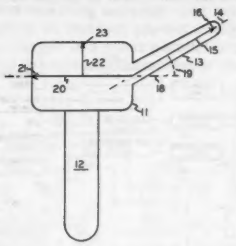
3,609,358

HAND HELD X-RAY GUIDE

Benedict J. Salesi, 710 Radnor Ave., Pine Beach, N.J.

Filed Apr. 9, 1970, Ser. No. 27,000
Int. Cl. G01n *21/00*
U.S. Cl. 250—64 **5 Claims**

A hand held X-ray guide is provided for the proper exposure and alignment of X-ray photography of dental patients that includes a member having a handle and an extension for



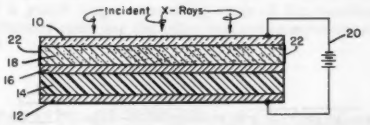
an alignment for the film with respect to the patients ear and teeth.

3,609,359

X-RAY IMAGE INTENSIFIER WITH ELECTRON MICHROCHANNELS AND ELECTRON MULTIPLYING MEANS

Eugene Wainer, and Richard A. Fotland, both of 2905 East 79th St., Cleveland, Ohio

Filed Jan. 8, 1969, Ser. No. 789,866
Int. Cl. G03b *41/16*
U.S. Cl. 250—65 R **38 Claims**



An apparatus for the amplification of X-ray images which comprises a layered structure which can be adapted to fit in the usual cassette and having an X-ray-sensitive film composition in close proximity to a multiplying layer, which achieves its multiplication through the formation and acceleration of electrons and/or ions or charged particles as a consequence of direct or filtered impact of X-rays on such layered structure which includes the multiplying layer.

3,609,360

NEGATIVE PROJECTION TRANSPARENCIES AND METHOD

Joseph A. Wiese, Jr., 3 M. Center, St. Paul, Minn.

Filed Sept. 15, 1969, Ser. No. 858,172
Int. Cl. G01n *21/34*
U.S. Cl. 250—65 T **7 Claims**

Clear-colored film products, which are decolorized at image areas by thermographic heating to form negative projection transparencies of positive originals, contain a colored reaction product of a color precursor and a volatilizable acid. The colored compound is decomposed and the liberated acid is volatilized and removed at the heated image areas, leaving a clear colorless transparent image.

3,609,361

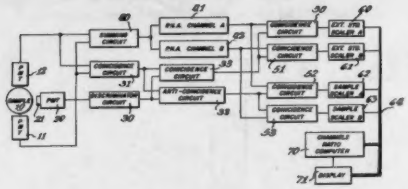
METHOD AND APPARATUS FOR EXTERNAL STANDARDIZATION OF LIQUID SCINTILLATION SAMPLES

Phillip Shevick, Evanston, Ill., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed Sept. 20, 1968, Ser. No. 761,129
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 **14 Claims**

A radioactive source material of the type producing substantially coincident penetrating and nonpenetrating radiations is dispersed throughout a scintillating medium positioned external and adjacent to a liquid scintillation sample. A substantial number of the penetrating radiations produce scintillations in the sample and substantially all of the non-

penetrating radiations produce tag scintillations in the external medium. Separate detectors for sample and tag scintillations produce either coincident or anticoincident output pul-



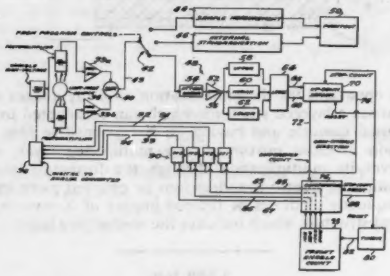
ses depending upon whether the detected event is a standardizing or a sample event, and logic circuitry is provided to count, simultaneously or in sequence, sample pulses and standardizing pulses.

3,609,362

ERROR CORRECTION IN RADIOACTIVE SAMPLE MEASUREMENTS

Barton H. Laney, Deerfield, Ill., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.

Filed Feb. 8, 1968, Ser. No. 703,938
Int. Cl. G01t *1/20*
U.S. Cl. 250—71.5 **17 Claims**



A liquid scintillation counting system with provision for measuring the efficiency correction of each primary sample measurement without intervening change of transducer gain is also provided with frequent standardization of transducer gain to eliminate efficiency change due to gain change from both the primary measurement and the efficiency correction measurement. Gain measurement and correction are made by circuits comparing the cumulative differential count on opposite sides of a standard alpha-particle spectrum peak with limit values numerically increased in successively longer portions of the counting interval. Gain correction is made in accordance with statistically probable gain error, and the counting interval is reinitiated. Particular circuits are described.

3,609,363

METHOD OF PROSPECTING FOR MINERAL DEPOSITS HAVING RADIOACTIVE GASEOUS DECAY PRODUCTS

George H. Milly, Rockville, Md., assignor to Geomet Mining and Exploration Company, Rockville, Md.

Filed Mar. 4, 1969, Ser. No. 804,219
Int. Cl. G01t *1/16*
U.S. Cl. 250—83 **4 Claims**

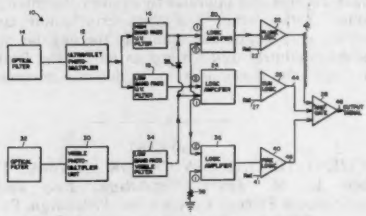
Prospecting, particularly prospecting for uranium, thorium and the like radioactive ore deposits having a gaseous decay product which diffuses through the earth's structure and becomes windborne.

3,609,364

HYDROGEN FIRE DETECTION SYSTEM WITH LOGIC CIRCUIT TO ANALYZE THE SPECTRUM OF TEMPORAL VARIATIONS OF THE OPTICAL SPECTRUM

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Robert L. Proffit, Chatsworth, Calif.

Filed Feb. 2, 1970, Ser. No. 7,868
Int. Cl. G08b *17/12*; G01t *1/16*; H01j *39/12*
U.S. Cl. 250—83.3 UV **5 Claims**



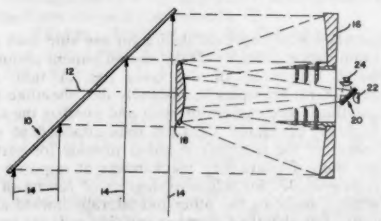
A hydrogen fire detector for use on a high altitude rocket. A hydrogen fire is detected by the ultraviolet radiation of the hot oxygen-hydrogen radical produced by hydrogen combustion, while the device selectively filters out ultraviolet radiation from other sources. The detection system senses both temporal variation and steady state radiation. Discrimination against engine exhaust plume radiation is accomplished by monitoring temporal variation. Solar discrimination is accomplished by a two-color technique whereby radiation is detected by two photomultiplier tubes, one filtered to accept visible radiation and the other filtered to accept ultraviolet radiation. The photomultiplier tubes control input to logic that produces an output signal only when a hydrogen fire is viewed.

3,609,365

RADIOMETER ARRANGEMENT AND CONTROL CIRCUIT THEREFOR

Frank R. Malinowski, and James S. Lee, both of Santa Barbara, Calif., assignors to Santa Barbara Research Center, Goleta, Calif.

Filed Sept. 1, 1967, Ser. No. 665,025
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 **9 Claims**

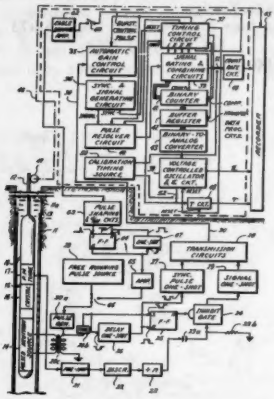


The invention is directed to a radiometer arrangement which may be utilized to periodically scan a source of electromagnetic radiation and provide an electrical output signal accurately related to the radiation emanating from the source. A control circuit is provided to synchronize the transmission of radiation information with the rotary action of the arrangement during successive scans. A DC signal amplifier is employed and means are provided to restore the amplifier to a base level periodically, thus eliminating false information that could be generated within the system by amplifier drift.

3,609,366
SYSTEMS FOR NEUTRON DECAY TIME WELL LOGGING

Robert J. Schwartz, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 1, 1968, Ser. No. 772,540
Int. Cl. G01v 5/00
U.S. Cl. 250—83.3 34 Claims



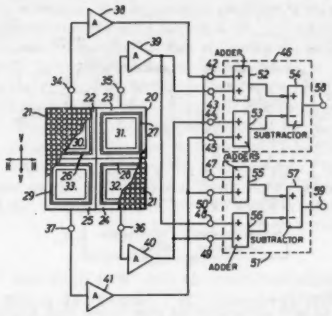
In accordance with an illustrative embodiment of the present invention, a well-logging exploring device includes a pulsed neutron source which is repetitively energized to irradiate a formation with neutrons and means for generating a sync pulse representative of the time of termination of such irradiation. In response to this irradiation, a nearby scintillation counter generates signal pulses at a rate representative of the neutron population in the media surrounding the exploring device. The sync and signal pulses are then transmitted to the surface of the earth. At the surface of the earth, signal-processing circuits operate to accurately distinguish the sync and signal pulses and resolve any signal pulses which may have become merged due to the relatively low frequency response of the cable. These resolved signal pulses are then applied to computing circuits which operate to determine the rate of decay of the neutron population in the formation by determining the rate of change of the signal pulse repetition rate. In this connection, the signal pulses are weighted and then gated to a binary counter during a cycle of adjustable time intervals. By appropriately selecting the relationship of the time intervals to one another and the factors by which the signal pulses are weighted during each time interval, the accumulated count in the counter after each cycle of time intervals will be representative of the rate of decay of the neutron population and is used to determine the time intervals. The sync pulses synchronize the surface electronics with the repetitive irradiation of the formation with neutrons.

3,609,367
STATIC SPLIT PHOTOSENSOR ARRANGEMENT HAVING MEANS FOR REDUCING THE DARK CURRENT THEREOF

Donald Robert Barron, Sunbury-on-Thames, England, assignor to Electric & Musical Industries Limited, Hayes, Middlesex, England

Filed Sept. 4, 1969, Ser. No. 856,896
Claims priority, application Great Britain, Sept. 4, 1968, 42,151/68
Int. Cl. G01j 3/00; G02b 5/14
U.S. Cl. 250—83.3 H 5 Claims

A static split photosensor arrangement includes a split optical system lying between an incidence plane and an emergence plane. The optical system comprises a plurality of optical fibers having diameters which taper from a relatively large diameter at the incidence plane to a relatively small diameter at said emergence plane. The fibers are so arranged that their relatively large diameter ends form a substantially continuous receiving surface for incident photon energy in said incidence plane, and their relatively small diameter ends form a plurality of groups in said emergence plane, each of said groups communicating uniquely with one of a plurality of surfaces sensitive to incident photon energy, the sensitive surfaces being arranged in a plane parallel to said emergence plane. Because of the tapering diameters of the optical fibers,

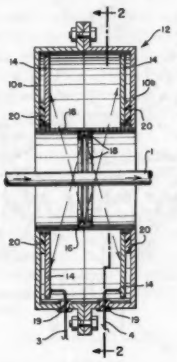


the combined areas of the plurality of sensitive surfaces is less than the area of the receiving surface and therefore, while the system remains substantially continuous with regard to the reception of photon energy, the sensitive surfaces may be separated by a sufficient distance to enable the insertion of a guard ring surrounding each of the sensitive surfaces, thereby reducing the edge leakage component of dark current.

3,609,368
APPARATUS AND METHOD FOR CHECKING THE DIAMETER OF ELONGATED STRUCTURES

Jurgen Knorr, Dresden; Helmut Loffler, Dresden, and Wolfgang Vogel, Weinbohla, all of Germany, assignors to VEB Kabelwerk Oberspree (KWO), Berlin-Oberschoneweide, Germany

Filed Apr. 9, 1968, Ser. No. 719,980
Int. Cl. G01t 1/18; G01n 23/02
U.S. Cl. 250—83.6 15 Claims

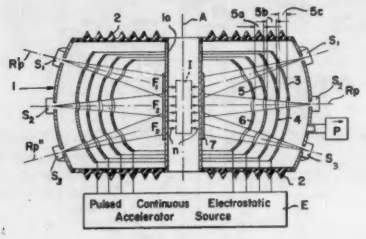


Apparatus and method for checking the diameter of elongated structures, such as cables and insulated conductors, without contact and destruction, in a continuous manner, by passing the structure axially through an ionization device, providing radioactive radiation which impinges on the structure while it passes through the chamber, allowing the radiation to be weakened by its passage through the structure and to act upon electrode means also disposed in the chamber, and measuring the ionization current generated by the electrode means, the current being representative of the diameter of the structure as it passes through the device.

3,609,369
NEUTRON GENERATOR WITH RADIATION ACCELERATION

Petrica Croitoru, Bucharest, Romania, assignor to Instituttul de Fizica Atomica (IFA), Bucharest, Romania

Filed Apr. 9, 1968, Ser. No. 719,887
Claims priority, application Romania, Apr. 10, 1967, 53519
Int. Cl. G21g *3/04*
U.S. Cl. 250—84.5 **9 Claims**

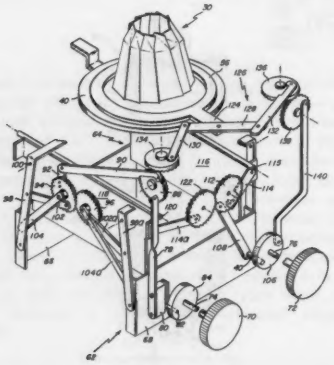


Method of and apparatus for generating high neutron flux at a sample zone maintained at atmospheric pressure and surrounded by an annular evacuated generator housing along whose inner peripheral wall is provided a neutron emitter target. An annular array of ion-particle sources or an annular ion source surrounds the annular target to direct radial charged-particle beams thereagainst. The acceleration may be effected by radially spaced accelerator plates disposed between the source and the target within the chamber or by radio waves supplied to the chamber; the latter is then constituted as a coaxial resonant cavity.

3,609,370
RADIATION COLLIMATOR FOR USE IN X-RAY SYSTEMS

Leonard F. Peyser, Briarcliff Manor, N.Y., assignor to The Machlett Laboratories Incorporated, a wholly owned subsidiary of Ratheon Company, Springdale, Conn.

Filed Dec. 23, 1969, Ser. No. 887,602
Int. Cl. G03b *41/16;* **G21f** *5/02;* **H01j** *35/16*
U.S. Cl. 250—105 **4 Claims**

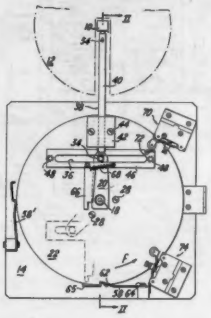


Collimating apparatus for regulating the cross-sectional size and shape of a beam of radiation which comprises a first shutter device adapted to be positioned adjacent the source of radiation and a pair of associated plane shutter devices cooperatively connected with the first shutter device whereby when either of the plane shutter devices is operated the first shutter will simultaneously be operated, the means by which the plane shutter devices are interconnected with the first shutter device being such that the cross-sectional size and shape of the beam passing through the collimator will be controlled by the plane shutter device, and the first shutter will intercept marginal radiation but will not intercept the primary to such an extent as will decrease the size of the beam regulated by the plane shutter devices.

3,609,371
MECHANISM FOR POSITIONING A RADIOACTIVE SOURCE IN A LIQUID SCINTILLATION COUNTER

Jean Claude Jacob, Plaisir, France, assignor to Intertechnique S.A., Plaisir, France

Filed June 11, 1968, Ser. No. 736,073
Int. Cl. G01t *7/08*
U.S. Cl. 250—106 **6 Claims**



A mechanism for positioning a standard gamma emitter for use as an external standard in a liquid scintillation spectrometer as adapted to move the emitter between a shielded position in a metal body and an operative position close to a sample to be standardized. The mechanism comprises a rotatable disk, an arm carrying the emitter and connected to a motor by a driving mechanism which successively moves the emitter radially inward with respect to the disk, along a part circular path along with the disk and radially outward upon energization of the motor.

3,609,372
SHAPED POLYMERIC SHIELD AGAINST NEUTRON AND GAMMA RADIATION

Reinhard Ernst Vogel, Munich,Harlaching, Germany, assignor to Friedrich Marxen, Vaduz, Grand Duchy of Liechtenstein, a part interest

Continuation-in-part of application Ser. No. 596,764, Nov. 25, 1966, now Patent No. 3,434,978. This application Sept. 6, 1968, Ser. No. 758,107
Int. Cl. G21f *1/10*
U.S. Cl. 250—108 **14 Claims**

A polymeric material having a shielding effect against radiation is provided in the form of any shaped body which may be a plate, flexible sheet, or of any other desired shape, which body consists essentially of a synthetic plastic material including synthetic rubber, or of natural rubber, having distributed therethrough and intimately mixed therewith an effective amount of at least one compound of a saturated fatty acid being solid at room temperature and having at least 9 carbon atoms with at least one metal selected from the group consisting of lead, bismuth, tungsten, zirconium, iron, tin, cadmium, lithium and barium.

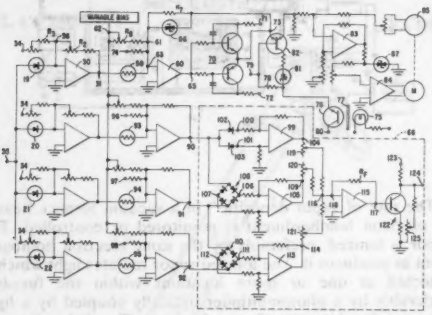
3,609,373
PHOTOELECTRIC SENSORS AND CIRCUITRY FOR EDGE-GUIDING SYSTEMS FOR SEWING MACHINES

Dhimat R. Desai, Somerville, and Carl T. Aquilino, Middlesex, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed May 18, 1970, Ser. No. 38,281
Int. Cl. G05b *5/00*
U.S. Cl. 250—202 **11 Claims**

A photoelectric sensor system is described for generating information signals related to the actual edge position, trans-

parency and edge curvature of the material to be sewn by a sewing machine in an edge-guiding system. Photodiodes, preferably of the PIN type, are used in a bar-type geometry for the sensors which have a special spaced arrangement relative to the needle. Signal processing involving operational amplifiers is used in connection with a reference sensor which continuously monitors the material transparency to correct for the transparency error and produces a single steering servo signal which is a true measure of edge position deviation from a desired position. A plurality of sensors, positioned in increasingly spaced relation to and in advance of the needle, generate signals related to the edge positional error at these advanced positions. These error signals are then processed by special circuits to yield signals containing



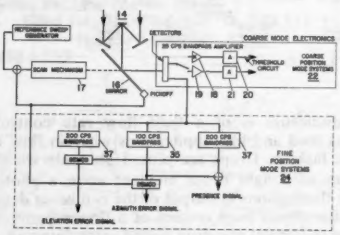
advanced edge curvature information at the various sensor positions. Finally a single composite signal is derived from the component signals with proper weighting of the contribution of each component signal to the composite signal in accordance with the relative distances of the sensors from the needle. This composite signal may be derived as a voltage or as a current and then used to control the optimum feeding rate of the sewing machine by any conventional speed control system which responds proportionally to the variation of a single signal. The edge curvature information is thus continuously updated in advance of the needle so that the feed rate can be changed in time responsively to the curvature complexity to permit more or less time as needed for the steering servo to make proper correction just before each stitch is made.

3,609,374

WEIGHTED SCAN STAR SCANNER

Philip Gevas, Roseland, N.J., assignor to Singer-General Precision, Inc., Little Falls, N.J.

Filed Feb. 24, 1967, Ser. No. 619,889
Int. Cl. G01s *5/16*
U.S. Cl. 250—203 R **7 Claims**



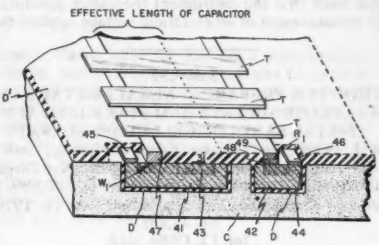
Possible incident star energy is directed onto a deflecting mirror as a beam which will systematically reflect said beam upon one of a plurality of detector elements arranged in a linear array, generating a signal. This signal is amplified and fed to a level detector. When a predetermined threshold is exceeded, the output of the level detector activates a trigger. The trigger activates a flip-flop which causes the scanner to reverse and rescan the limited area where the possible stars occurred. This time, the signal is passed through another channel wherein the time constant for the filter is increased by about three, (the number of rescans). This results in an improvement in the signal to noise ratio of about at the point in question. The level detector trigger associated with the second channel is set at a higher threshold. When this trigger is activated, the acquisition problem is solved and the probability of star presence is over 0.99. This second channel trigger enables a second flip-flop switching the scanner to the fine mode, whose purpose is merely of more accurately defining the position of the star in the search field. In the fine mode, when the signal from the star is centered, an output at one frequency may be provided whereas an increasingly large off-axis error signal in another frequency may be provided for offcenter both in azimuth and elevator. These error signals act on the scanner so as to move the scanner in line with the star scanned.

3,609,375

SOLID STATE LINEAR PHOTOSENSOR

Murray Bloom, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed July 19, 1968, Ser. No. 746,072
Int. Cl. H01l *15/00*
U.S. Cl. 250—211 **5 Claims**



There is disclosed a linear solid-state photosensor which exhibits avalanche multiplication and which has a resolution capability comparable to that of silver halide photography. The photosensor is of the type which is suitable for use in a slit image camera of the type commonly carried by airplanes, satellites, or any other moving vehicle which can position the image forming slit so that the scene to be photographed passes by it. In this event, of course, the movement of the scene relative to the camera replaces the more conventional movement of the film relative to the camera's optical axis. The photosensor of this invention replaces the film of the camera in such applications and is capable of providing a direct conversion of the light image to electrical signal output in a manner analogous to that of a television camera. There is also disclosed herein a method of manufacturing the linear solid-state photosensor so as to achieve the desired resolution.

3,609,376

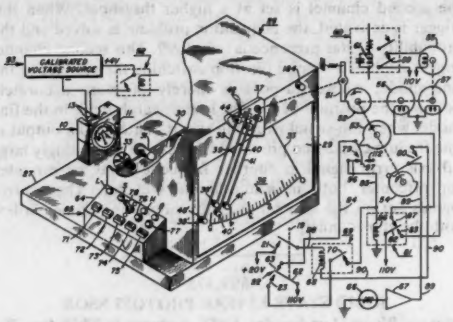
AUTOMATIC CALIBRATING APPARATUS FOR ELECTRICAL INSTRUMENTS

Earl S. Seely, Boonton, and William J. Jauch, Denville, both of N.J., assignors to RFL Industries, Inc., Boonton, N.J.

Filed May 21, 1970, Ser. No. 39,468
Int. Cl. G01d *5/34*
U.S. Cl. 250—215 **15 Claims**

Apparatus for automatically charging and treating the permanent magnet of an electrical instrument having a pointer movable over a preprinted scale. A plurality of photoconductive cells are mounted for positioning along a viewing screen upon which an enlarged image of the instrument scale and

pointer are projected. The photocells respond to the light passing through the screen and effect operation of associated circuitry and components for first charging the instrument



magnet to saturation and then treating the magnet to final strength such that the instrument thereafter provides an accurate measurement of an electrical voltage applied thereto.

3,609,377

METHOD FOR PREPARING ALKALI METAL SALTS OF CELLULOSE SULFATE AND STABILIZED ALKALI METAL SALTS OF CELLULOSE SULFATE

David J. Pettitt, and Jerome Edward Murray, both of San Diego, Calif., assignors to Kelco Company, San Diego, Calif.

Continuation-in-part of application Ser. No. 780,899, Dec. 3, 1968, now abandoned. This application June 16, 1970, Ser. No. 46,831

Int. Cl. C08b *5/14*

U.S. Cl. 260—215 **34 Claims**

Improved process for preparing alkali metal salts of cellulose sulfate, said process comprising adding at least about a stoichiometric quantity of a powdered alkali metal salt of a weak inorganic acid, e.g., a carbonate, bicarbonate, borate, phosphate or silicate, to a reaction mixture containing cellulose sulfate in admixture with a lower N-dialkyl amide, water formed from the sulfation reaction, and optionally a diluent other than a lower N-dialkyl amide. A controlled quantity of water is added to the reaction mixture in conjunction with the addition of the alkali metal salt of a weak inorganic acid and alternatively, part or all of the added water may be introduced as chemically bound water in the alkali metal salt. The amount of water is sufficient to promote contact between the reactants but insufficient to form a pasty reaction mass. The neutralization reaction is conducted with agitation until neutralization is essentially completed which is accompanied by a pH change from highly acid to about 7.0 or above.

Method for preparing salts of cellulose sulfate having improved stability by coprecipitating said cellulose sulfate salts with an excess of an alkali metal salt of a weak inorganic acid in an effective amount to provide a stabilizing quantity of the salt of the weak inorganic acid in the precipitated product. Preferably, the excess of the salt of a weak inorganic acid is sufficient to provide at least about 0.1 percent by weight of the salt of the weak inorganic acid in the precipitated product. The coprecipitation may be carried out in the presence of divalent cations which enhance the coprecipitation and increase the percentage of the salt of the weak inorganic acid in the product.

A cellulose sulfate salt having improved stability, said salt containing an excess of a salt of a weak inorganic acid in an effective quantity to stabilize the cellulose sulfate salt. Preferably, the salt of the weak inorganic acid is present in an amount of at least about 0.1 percent by weight.

3,609,378

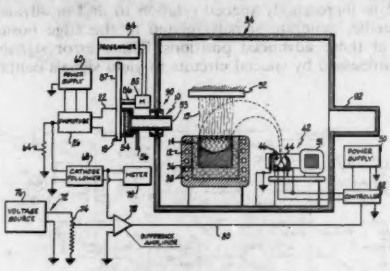
MONITORING OF VAPOR DENSITY IN VAPOR DEPOSITION FURNANCE BY EMISSION SPECTROSCOPY

Hugh Roscoe Smith, Jr., Piedmont, Calif., assignor to Air Reduction Company, Incorporated

Filed Oct. 31, 1966, Ser. No. 590,736

Int. Cl. G02f *1/28*

U.S. Cl. 250—217 **11 Claims**



The rate of vapor deposition in a vacuum furnace heated by electron bombardment is monitored or controlled. The vapor is ionized, preferably by the same electron bombardment as produces it. The ionized vapor radiates light which is detected at one or more locations within the furnace, preferably by a photomultiplier optically coupled by a light pipe to the interior of the furnace. The light detector produces a signal indicative of the intensity of the light detected and, hence, of the vapor density. Optical filters may be used to pass light of frequency characteristic of particular elements, so that the relative intensity of the particular elements in the vapor may be selectively detected. The signals may be recorded or used to control the heating and, hence, vapor density, as by controlling the electron emission from an electron gun.

3,609,379

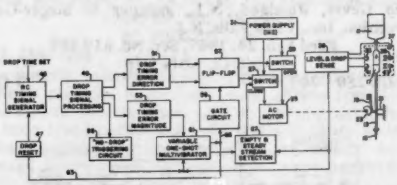
PHOTOELECTRIC DROP SENSING AND TIMING CONTROL FOR INTRAVENOUS FEED AND OTHER FLOW CONTROL APPLICATIONS

Herbert John Hildebrandt, Baldwinsville, N.Y., assignor to General Electric Company

Filed May 13, 1969, Ser. No. 824,162

Int. Cl. G01n *21/26*

U.S. Cl. 250—218 **14 Claims**



This disclosure is of a fluid flow rate control for intravenous feed and like applications wherein flow occurs in dropwise fashion. Drops are sensed photoelectrically by interruption of a light beam incident upon a photocell, the resulting fluctuations in output of the cell being detected and utilized for closed loop control of a flow adjustment device operative to correct any drop timing error detected. The control circuitry described includes means enabling discrimination between discrete drops and a steady stream or column of liquid as occasionally is experienced in intravenous feed apparatus, and means enabling discrimination also as between the primary or main drop and small secondary drops which sometimes form with and trail immediately after the main drop and which, if sensed, introduce errors into the drop timing measure obtained. For purposes of shutting off flow just

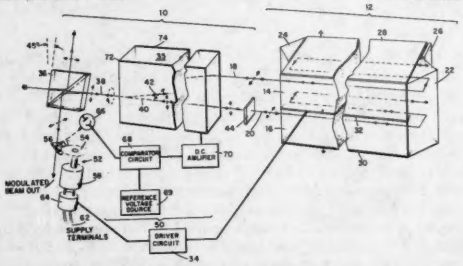
prior to exhaustion of the fluid supply, means are provided for sensing fluid level at some point in the system indicative of the approach of this condition, such sensing being accomplished by photoelectric means arranged to afford reliable indication of fluid level irrespective of the transparency or opacity of the particular fluid involved. Means also are provided for shutting off flow in the event of photosensor light source failure.

3,609,380
RADIATION SENSITIVE DEFECT SCANNER FOR TRANSPARENT MATERIALS
Hugh E. Shaw, Jr., New Kensington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Nov. 29, 1968, Ser. No. 779,729
Int. Cl. G01n *21/32*
U.S. Cl. 250—219 **9 Claims**

A method and apparatus for detecting defects in glass by scanning glass sheets with a beam of highly collimated light to detect defects in the glass interpositioned between a stationary collimated light source and a stationary detection device, as the defects interrupt the light beam.

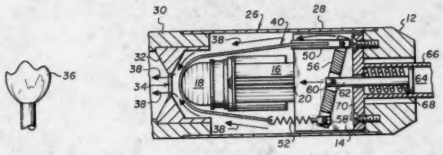
A collimated light source, a scanning prismatic mirror, and a light responsive detection source comprises the system. A multisided prismatic mirror is interpositioned between the light source and the detection device to provide an effective light path which is longer than the distance between the source and the detector, and scans the glass.

3,609,381
ELECTROOPTIC LIGHT MODULATOR WITH BIREFRINGENT BEAMSPLITTER-RECOMBINER
Edward D. Hartfield, Los Altos, Calif., assignor to Technical Operations, Inc., Burlington, Mass.
Filed July 31, 1968, Ser. No. 749,111
Int. Cl. G02f *1/20, 1/26*
U.S. Cl. 250—225 **14 Claims**



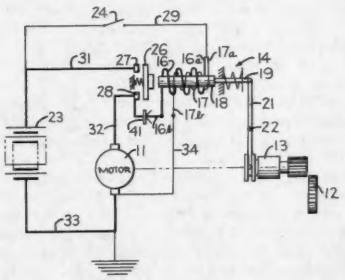
This disclosure depicts an electrooptic light modulator comprising a novel birefringent beamsplitter-recombiner transmitting a pair of orthogonally polarized beam components to a pair of field-controlled anisotropic crystals. Each of the pair of light beams from the beamsplitter is directed along a reiterative light path through a crystal and returned by means of an end mirror to the point of entrance of the beam into the crystal. After leaving the crystals, the beam components are reunited by the beamsplitter-recombiner; the composite beam is analyzed by a Glan prism. Thermal drift responsive means monitoring the operating point of the modulator controls a compensating DC bias potential applied across the beamsplitter medium.

3,609,382
LIGHT DETECTOR WITH CLEANING AND TESTING MEANS
William J. Moore, and Donald J. L. Lin, both of Dallas, Tex., assignors to Forney Engineering Company, Dallas, Tex.
Filed Aug. 15, 1969, Ser. No. 850,603
Int. Cl. G01d *5/36*
U.S. Cl. 250—232 **6 Claims**



A furnace flame detector having a light-sensitive tube which can be periodically wiped clean and blocked off from the flame light to be tested. A web has a wiper section in contact with the tube and is connected with an actuating mechanism for periodically moving the wiper section over the tube. The wiper section has a centrally located aperture which permits the flame light to impinge on the sensing tube, so that when the wiper section is moved over the tube, it is cleaned and the flame light is intermittently blocked off to permit the tube to be tested.

3,609,383
SOLENOID-OPERATED STARTING MOTOR
James P. Welsh, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Sept. 18, 1970, Ser. No. 73,481
Int. Cl. H02p *1/10*
U.S. Cl. 290—38 R **3 Claims**



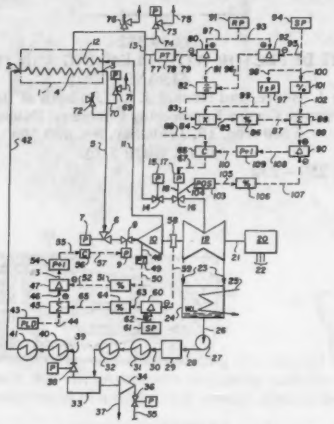
In a solenoid circuit for a staring motor, a solenoid has both a pull-in coil and a hold-in coil for positioning an armature to effect engagement and disengagement of the starting motor with an engine. Shifting of the armature also closes a parallel circuit between an electrical source and the starting motor. A diode is arranged in series with one end of the pull-in coil to prevent reverse current flow through the pull-in coil and the development of a magnetomotive force therein counter to force developed by the hold-in coil.

3,609,384

CONTROL MEANS FOR STABILIZING A STEAM-DRIVEN REHEAT-TYPE TURBINE GENERATOR AFTER SUDDEN RUNBACK OF ELECTRIC GENERATION

Charles Strohmeyer, Jr., Wyomissing, Pa., assignor to Electrodyne Research Corporation, Reading, Pa.

Filed Sept. 3, 1969, Ser. No. 854,883
Int. Cl. H02p 9/04
U.S. Cl. 290—40 7 Claims



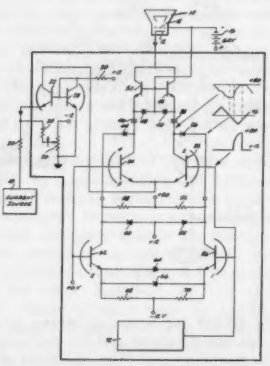
The invention provides a means of minimizing acceleration of a steam-driven reheat-type turbine generator after sudden partial runback of electric generation as a result of stored energy in the turbine driver whereby flow of reheated steam to the reheat turbine through the intercepter valves is controlled as a function of upstream pressure and similarly steam flow to the high pressure turbine is controlled by pressure of said high pressure turbine to regulate electrical output after runback and while simultaneously releasing surplus energy.

3,609,385

LOW-TO-HIGH VOLTAGE CURRENT COUPLER CIRCUIT

Ted W. Berwin, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 6, 1969, Ser. No. 868,664
Int. Cl. H02j 1/00
U.S. Cl. 307—49 9 Claims



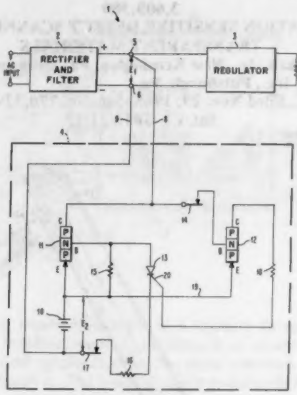
A circuit is provided which can apply a current which exists at a low voltage to the input terminal of apparatus, such as a cathode-ray tube, which must be biased at a high voltage.

3,609,386

APPARATUS FOR PROVIDING UNINTERRUPTED POWER TO A LOAD

Alvin M. Patlach, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,626
Int. Cl. H01f 1/00
U.S. Cl. 307—66 16 Claims



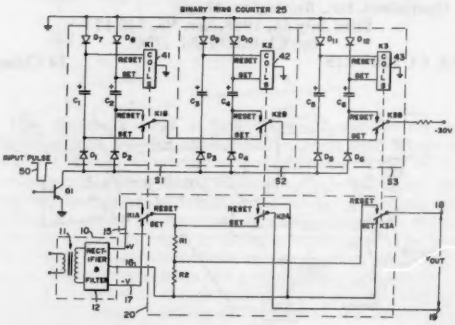
Apparatus for switching power sources to a load without interruption is disclosed. The apparatus includes a source of rectified and filtered AC, a regulator, and a load. The AC source feeds DC power of given voltage to two terminals. A sensing and power delivery circuit is connected to these same two terminals to provide power from a DC source when the power from the AC mains suffers a degradation. The sensing and power delivery circuit includes a saturable switching transistor which switches the battery across the above-mentioned two terminals when a sensing circuit detects a change in the rectified and filtered AC. The sensing circuit controls a controlled rectifier which closes a current path around the battery permitting the switching transistor to saturate thereby effectively placing the DC source across the load terminals. A battery charging arrangement is also shown.

3,609,387

REFERENCE VOLTAGE-SWITCHING UNIT

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Edgar S. Davis, Pasadena, Calif.

Filed Mar. 23, 1970, Ser. No. 21,906
Int. Cl. H03k 23/03
U.S. Cl. 307—81 9 Claims



A reference voltage-switching unit comprising a dual DC voltage power supply which provides +V DC and −V DC

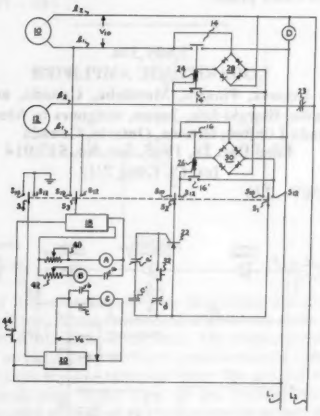
voltages across three of its output terminals, one of which is assumed to be at ground. The three terminals are connected to two unit output terminals through a switching unit which includes a voltage divider and three sets of SPDT contacts. The positions of the three sets of contacts are controlled as a function of the binary states of three stages of a three-stage ring counter. As the counter advanced through its eight-state cycle, the positions of the three sets of contacts vary so that the voltage across the unit output terminals follows a cyclically recirculating pattern including the values of +V, +V/2, O, −V/2, $-^{V}$ · −V/2 O and +V/2.

3,609,388

AUTOMATIC PARALLELING CIRCUIT

Stuart F. Hemmenway, Scotia, and William H. Turner, Jr., Schenectady, both of N.Y., assignors to General Electric Company

Filed June 24, 1970, Ser. No. 49,317
Int. Cl. H02j *3/38*
U.S. Cl. 307—87 **10 Claims**



A circuit for automatically paralleling AC generators. Upon detecting a first, small differential voltage between a main bus and the corresponding terminal of an off-line generator a first relay is actuated, applying the differential voltage to a second relay. When the differential voltage attains a second, higher value a circuit for energizing mechanical contactors is partially completed. As the differential voltage subsequently lessens, the first relay drops out, completing the energization of the circuit and the mechanical contactors. The dropout voltage of the first relay is such that the increment of time necessary for the differential voltage to fall from the first relay dropout voltage to zero is substantially the same as the time necessary for the actuation of the contactors.

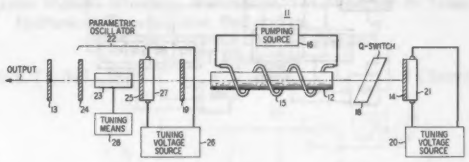
3,609,389

PASSIVE PULSE TRANSMISSION MODE OPERATION IN A Q-SWITCHED LASER HAVING AN INTERNAL PARAMETRIC OSCILLATOR

John Ernst Bjorkholm, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Jan. 15, 1970, Ser. No. 3,140
Int. Cl. H03f *7/04*
U.S. Cl. 307—88.3 **6 Claims**

Passive pulse transmission mode (PTM) operation is established in a Q-switched laser by means of a parametric oscillator located within the resonator of the laser which functions as a pump for the oscillator. The oscillator is adapted to deplete the pump at the moment the incavity pump power reaches a maximum, resulting in highly efficient conversion of pump power to signal and idler power. In one embodiment, one of the laser reflectors is made highly transmissive to the nonresonant signal radiation, and the oscillator is made singly resonant (SRO) at the idler frequency, resulting in a substantial fraction (ideally at least one-half) of the laser power being coupled out of the cavity in twice the round trip time of the laser resonator, but at the signal



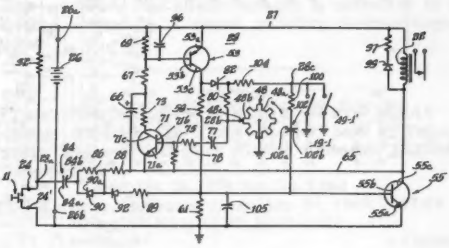
wavelength. Since the SRO is tunable, the short, high power output pulse is also tunable from the pump wavelength to longer wavelengths. Other embodiments utilizing doubly resonant oscillators and ring-type configurations are also disclosed.

3,609,390

TRIGGER CIRCUIT

Harold Feldman, Skokie, Ill., assignor to Chamberlain Manufacturing Corporation, Elmhurst, Ill.

Division of Ser. No. 732,253, May 27, 1968, Pat. No. 3,539,894.
Filed May 27, 1970, Ser. No. 40,790
Int. Cl. H01h *9/30*
U.S. Cl. 307—134 **4 Claims**



A trigger circuit having a particular (but not its only) utility in operating a garage door motor coupled to a garage door through a slip clutch. The trigger circuit has two operating states which respectively deenergize and energize the motor. The trigger circuit is operated between its motor deenergizing and energizing states by successive operation of manually operable contacts and is reset to its motor deenergizing state automatically and independently of the contacts when the slip clutch output shift slows down to a given speed. The trigger circuit is provided with a feature which inhibits contact chattering from operating the trigger circuit in the same manner as said successive operation of the manually operable contacts.

3,609,391

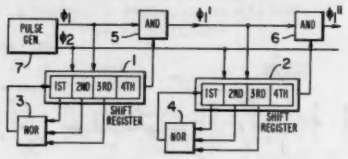
TIMING PULSE GENERATOR

Isao Hatano; Yashuhiko Tabata, and Masatoshi Mitsui, all of Kyoto-fu, Japan, assignors to Omron Tateisi Electronics Co., Kyoto-shi, Kyoto-fu, Japan

Filed June 5, 1969, Ser. No. 830,618
Claims priority, application Japan, June 5, 1968, 43/38895
Int. Cl. H03k *19/08*
U.S. Cl. 307—208 **10 Claims**

A timing pulse generator having a plurality of two-phase registers to generate timing pulses of desired pulse width. Each register furnishes an output from only one stage thereof

on the strength of a read-in pulse and memory pulse, and the output from the stage that furnishes the output is circulated,



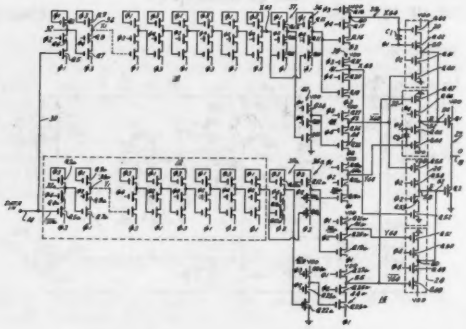
while the output from the last stage of one shift register is utilized as the read-in pulse for the subsequent shift register.

3,609,392

DYNAMIC SHIFT REGISTER SYSTEM HAVING DATA RATE DOUBLING CHARACTERISTIC

Attila Tetik, New York, N.Y., assignor to General Instrument Corporation, Newark, N.J.

Filed Aug. 21, 1970, Ser. No. 66,010
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 **4 Claims**



A shift register system capable of operating at data rates which are double the clock signal rate comprises first and second registers which receive first and second unique clock signals in reverse order respectively. Data is alternately sampled by the first register during the first clock signal and by the second register during the second clock signal. An output stage, including register output signal inverting circuitry, is provided to reconstitute the data at the system output in a manner which substantially reduces the system DC power dissipation.

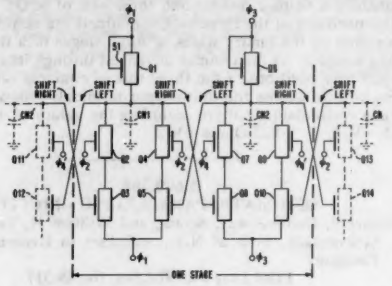
3,609,393

BIDIRECTIONAL DYNAMIC SHIFT REGISTER

Ying L. Yao, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,754
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 **24 Claims**

A bidirectional dynamic shift register using MOSFET's. Each stage of the shift register contains sections having storage elements for retention of data. Bidirectional means interconnect the sections and also adjacent stages. The bidirectional means controls the direction of flow of data by control of the status of any storage element in accordance with the status of the preceding storage element. That is, the state of the transferee storage element is determined by the state of the transferor storage element. Overlapping or



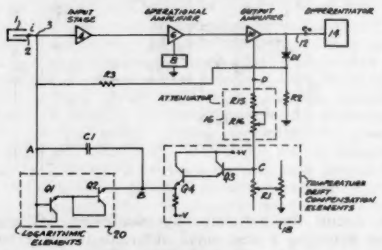
nonoverlapping clock pulses can be used, as well as any number of clock phases.

3,609,394

LOGARITHMIC AMPLIFIER

Colin G. Lennox, Pinawa, Manitoba, Canada, and Tomozo Furukawa, Ibaraki-ken, Japan, assignors to Atomic Energy of Canada Limited, Ottawa, Ontario, Canada

Filed Dec. 28, 1965, Ser. No. 517,014
Int. Cl. G06g *7/12*
U.S. Cl. 307—230 **6 Claims**



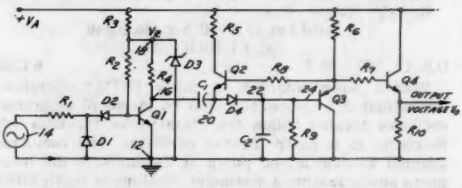
A logarithmic amplifier capable of operating with input currents as low as 10^{-11} amps having a capacitor feedback loop for smoothing out fluctuations at very low current inputs and a second feedback loop consisting of a resistor and diode to switch in the resistor at very low outputs to limit the time constant of the parallel connection of the feedback capacitor and logarithmic transistor elements to reduce output fluctuations at switch-on.

3,609,395

FREQUENCY TO VOLTAGE CONVERTER CIRCUIT

Zbigniew J. Jania, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

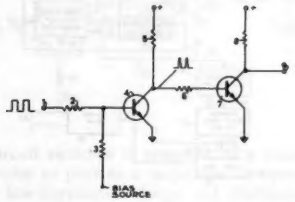
Filed Sept. 2, 1970, Ser. No. 68,837
Int. Cl. G01r *23/02;* **H02h** *7/20*
U.S. Cl. 307—233 **12 Claims**



An improved frequency to voltage conversion circuit is described. The unimproved basic circuit comprises a

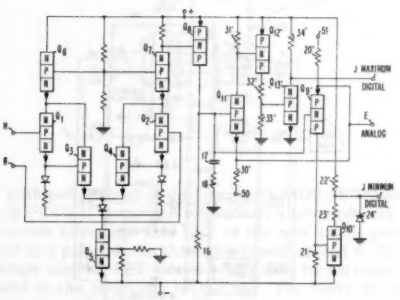
transistor, two capacitors, a resistor, and a diode. The improved circuit includes transistor means connected to the base of the transistor in the basic circuit to provide temperature compensation and to reduce or eliminate transient conditions. Additional transistors, diodes, and resistors are provided to effect protection against supply voltage transients, to provide additional temperature compensation where necessary, to assure the presence of an adequate signal to operate the frequency to voltage converter, and to provide the overall circuit with a high input impedance and a low output impedance.

3,609,396
PULSE-SELECTING CIRCUIT
Gerhard Gunter Gassmann, Berkheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Apr. 15, 1969, Ser. No. 816,285
Claims priority, application Germany, Apr. 27, 1968, P 17 62 197.5
Int. Cl. H03k *5/20*
U.S. Cl. 307—234 **2 Claims**



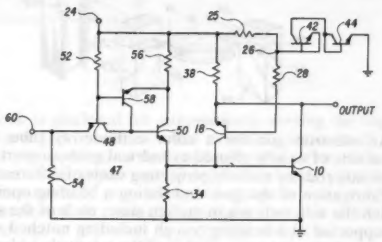
Pulses of different duration or frequency are coupled to the input of two series-connected transistors each having a different nonconducting delay time. The output pulses having a duration or frequency within a predetermined range of duration or frequency are removed from the second transistor. The nonconducting delay time of the second transistor is greater than the period of the pulses to be selected and the nonconducting delay time of the first transistor is shorter than the duration of the pulses to be selected.

3,609,397
SIGNAL-CLASSIFYING CIRCUIT
Louis F. Zaman, III, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 29, 1969, Ser. No. 888,580
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **7 Claims**



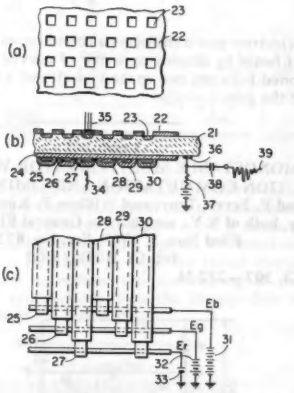
A system for identifying and selecting the maximum or minimum value of a single signal or a subset of signals from among a larger set of signals. The system includes an amplifier for each subset of signals. The outputs of the amplifiers are connected in common. Feedback loops from the common output to an input cause all amplifiers, except the one with the largest input signal, to operate in the nonlinear region. Each amplifier is monitored to determine whether or not it is operating linearly.

3,609,398
HIGH-SPEED INTEGRATED LOGIC CIRCUIT
John William Kronlage, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 31, 1968, Ser. No. 788,205
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **7 Claims**



High-speed logic switching is accomplished by employing an antisaturation clamped, prebiased output stage in a logic circuit of transistors having a high internal cutoff frequency. An output transistor in a logic circuit is shunted between the base and collector electrodes with a clamping transistor which shunts excess base drive to the collector electrode, thus preventing saturation thereof. When in a nonamplification mode, the clamping transistor comprises part of a voltage divider network that prebiases the base electrode of the output amplifier. This divider network is connected to a reference voltage in a circuit including series-arranged diodes.

3,609,399
TRICOLOR IMAGE PHOTODIODE PICKUP ARRAY
Masafumi Hanaoka, and Yasuo Minowa, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan
Filed Jan. 26, 1970, Ser. No. 5,804
Claims priority, application Japan, Jan. 31, 1969, 7687/69
Int. Cl. H01j *31/30;* **H01l** *15/02*
U.S. Cl. 313—66 **6 Claims**

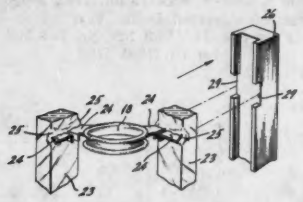


An improved target device for a tricolor image pickup device comprises a photodiode-array formed on one surface of a substrate. A transparent insulator layer is formed on the other surface of the substrate and a plurality of transparent electrodes on which filters are mounted, are mounted on the insulator layer at locations corresponding to the photodiode-array.

3,609,400
PLURAL ELECTRON GUN ASSEMBLY

Bruce G. Marks, Lansdale; Thomas P. Hodge, Lansdale, and Glenn Werst, Perkasie, all of Pa., assignors to Philco-Ford Corporation, Philadelphia, Pa.

Filed Nov. 3, 1969, Ser. No. 873,263
Int. Cl. H01j 25/50, 29/02, 1/92
U.S. Cl. 313—70 C 3 Claims

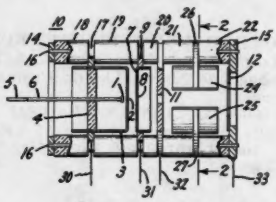


An electron gun for a color cathode-ray tube includes three sets of axially aligned cylindrical grids supported upon glass side rods by radially projecting studs of different widths. In fabrication of the gun, and during a beading operation in which the side rods are in molten state, each of the side rods is supported in a beading trough including notched wall sections in the regions of insertion of the relatively wider ones of the studs into the rods. The notched sections accommodate formation of strain-relieving bulges in the regions of wider stud insertion in the molten rods.

3,609,401
LINE FOCUS ELECTRON GUN

Lawrence A. Harris, Schenectady, N.Y., and Norman D. Punsky, Cambridge, Mass., assignors to General Electric Company

Filed Mar. 9, 1970, Ser. No. 17,416
Int. Cl. H01j 1/88, 29/02, 29/46
U.S. Cl. 313—82 8 Claims

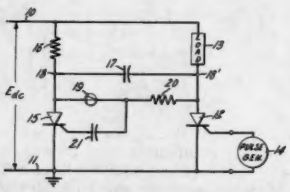


An electron gun transforms a round beam of electrons into a sheet beam by employing a pair of curved deflecting plates positioned between two spaced anodes of a final unipotential lens of the gun.

3,609,402
MONOSTABLE MULTIVIBRATOR WITH DUAL FUNCTION COMMUTATION AND TIMING CAPACITOR

Armand P. Ferro, Troy, and William P. Kornrumpf, Schenectady, both of N.Y., assignors to General Electric Company

Filed Nov. 3, 1969, Ser. No. 873,561
Int. Cl. H03k 17/00
U.S. Cl. 307—252 M 7 Claims

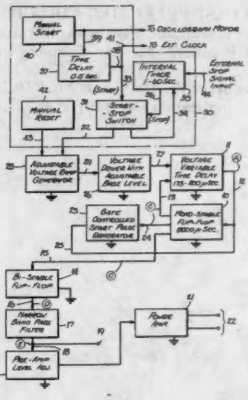


A two-thyristor capacitor-commutated multivibrator exhibiting monostable behavior is characterized by a voltage-sensitive gating circuit including a breakover switching device responsive to the commutating capacitor voltage. After a predetermined time delay the auxiliary thyristor fires to commutate off the load thyristor.

3,609,403
RATE OF CHANGE OF FREQUENCY GENERATOR

Edwin R. Eberle, Great Neck, N.Y., assignor to Consolidated Edison Company of New York, Inc., New York, N.Y.

Filed Nov. 5, 1968, Ser. No. 773,523
Int. Cl. H03k 5/00
U.S. Cl. 307—261 16 Claims

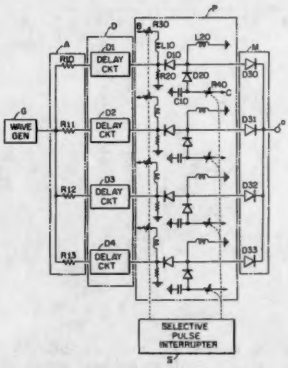


The voltage from a ramp generator, under the control of a control circuit, is superimposed upon an adjustable base frequency selecting voltage and utilized to control the time delay afforded by one stage of a 2-stage ring-type oscillatory system. The second stage provides a fixed time interval which when added to the delay provided by the first stage determines the period of one-half cycle of the desired output signal. The asymmetric signals from the oscillatory circuit control a bistable flip-flop whose symmetrical output is filtered to provide a sinusoidal test signal.

3,609,404
WORD PULSE GENERATING DEVICES USING SUCCESSIVE DELAY FOR PULSE FORMATION

Kozo Uchida, Tokyo, Japan, assignor to Iwatsu Electric Company Limited, Tokyo, Japan

Filed Sept. 15, 1969, Ser. No. 858,075
Claims priority, application Japan, Sept. 20, 1968, 43/67544
Int. Cl. H03k 5/00
U.S. Cl. 307—261 5 Claims



A clock pulse generator for word pulses is comprised of a signal generator, a distributor to divide the signal generated

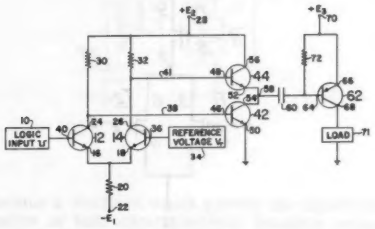
by the signal generator into a plurality of outputs, a plurality of parallel circuits connected to receive the divided signals, each circuit including a serially connected delay circuit and a pulser, and a mixer to combine outputs from the parallel circuits characterized in that the respective parallel circuits have equal delay time difference.

3,609,405

SHARP RISE-AND-FALL TIME, HIGH-AMPLITUDE PULSE GENERATOR

Jon M. Surprise, Mogadore, and Charles D. Blust, Stow, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Feb. 3, 1969, Ser. No. 795,799
Int. Cl. H03k *5/12*
U.S. Cl. 307—263 **6 Claims**



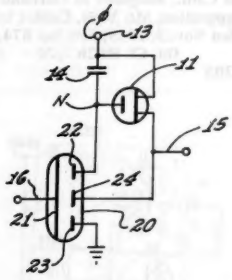
A pulse circuit switches in response to a bipolar digital logic input pulse to provide a sequential on-drive off-drive current thru low-impedance charge and discharge paths to drive an output semiconductor circuit. The output semiconductor circuit responds to the on-drive off-drive current and switches to provide a low-impedance charge path for a high-amplitude, high-speed output current pulse.

3,609,406

INTEGRATED CIRCUIT INVERTER

Terry R. Walther, Sunnyvale, Calif., assignor to Electronic Arrays Inc., Mountain View, Calif.

Filed Feb. 16, 1970, Ser. No. 11,565
Int. Cl. H03k *17/60*
U.S. Cl. 307—251 **12 Claims**



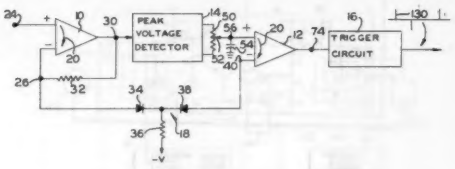
A push-pull inverter is disclosed with MOS-FET devices; a pair of FET's is connected between two terminals, the function serves as output. One FET of the pair has its gate connected to a pulse source through a capacitor and to the drain electrode another FET device which may be partially incorporated in the other one of the pair. The latter device has common grounded source and common gate to receive input. Two of such inverters can be cross coupled to establish a bistable device, or they can be serially connected as doubly inverting buffer, operated in either case by a common clock. Two such inverters can be serially connected and operated by alternating clocks and with coupling circuitry interposed for node separation to establish a shift register stage.

3,609,407

AUTOMATIC TRIGGER LEVEL CONTROL CIRCUIT

Valdis E. Garuts, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed June 9, 1969, Ser. No. 831,626
Int. Cl. H03k *5/20, 5/00*
U.S. Cl. 307—264 **11 Claims**



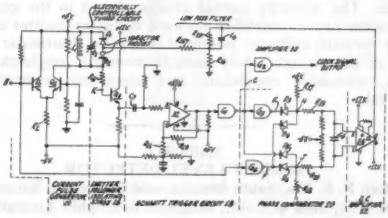
A circuit is disclosed for automatically varying the trigger level of a trigger circuit in order to maintain this level substantially proportional to the amplitude of a series of similar waveforms of an input signal. A peak detector provides a voltage substantially proportional to the peak voltage of the input waveforms. A manually adjustable fraction of the detected voltage is delivered to a control circuit as a control voltage to cause selection of increments of the input waveforms crossing a signal voltage level of these waveforms corresponding to the control voltage. The control circuit supplies control signals corresponding to such increments to a trigger circuit at a signal level which causes the trigger circuit to produce trigger pulses when the varying voltages of the input waveforms cross a signal level within the selected increments. This signal level remains substantially proportional to the peak voltage of the input signal waveforms even though this peak voltage changes.

3,609,408

CLOCK PULSE GENERATOR

Lewis Rand Motisher, Canoga Park, and Emil Engel, Los Angeles, both of Calif., assignors to RCA Corporation

Filed Sept. 30, 1969, Ser. No. 862,207
Int. Cl. H03k *17/00*
U.S. Cl. 307—269 **4 Claims**



Signals such as pulses derived from binary data signals are employed to excite a tuned circuit. When the frequency *nf* to which the tuned circuit is tuned differs from *n* times the actual frequency *f'* of the binary data signals, a control signal is produced which is employed to tune the tuned circuit in a sense and amount to reduce the control signal to zero. Clocking signals synchronous with the binary data signals may be derived from the tuned circuit.

3,609,409

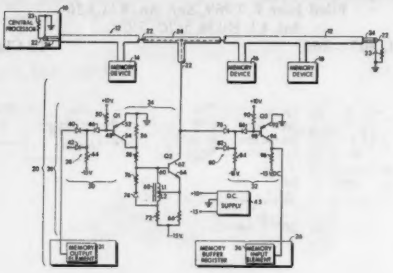
DATA TRANSMISSION CIRCUIT

Richard L. Best, Wayland, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 10, 1965, Ser. No. 478,545
Int. Cl. H03k *3/30, 19/22*
U.S. Cl. 307—275 **11 Claims**

A data transmission circuit for transmitting pulses from a data unit over a buss includes a regenerative pulse amplifier that responds to gated pulses from the data unit by applying

pulses of predetermined amplitude and shape to the buss. The amplifier includes a PN junction in series with its connection to the buss, with this junction being reverse biased in



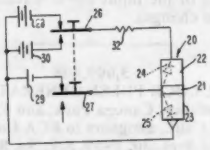
the absence of a pulse from the amplifier so as to present a high impedance to the buss. Regeneration is accomplished by means of an autotransformer which simplifies the amplifier circuit.

3,609,410

SWITCHING CIRCUITS UTILIZING MINORITY CARRIER INJECTION IN A SEMICONDUCTOR DEVICE

Jerry Saia, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 14, 1966, Ser. No. 586,775
Int. Cl. H03k *3/26*
U.S. Cl. 307—300 **4 Claims**



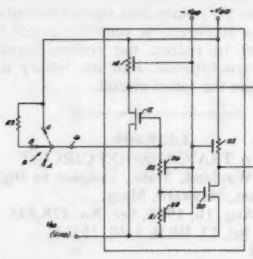
A family of circuits characterized by storage mode operation in a switching circuit employs minority carrier injection from the base into the collector region of a semiconductor device. The minority carrier charge stored in the collector thereafter causes amplified forward collector-emitter current when forward collector potential is applied. Particular examples of the circuit family include inverters, single-shot circuits, transistor oscillators and electronic switching in general.

3,609,411

MOSFET LEVEL DETECTOR

Stephen P. F. Ma, Santa Monica, and Thomas J. Kosco, Harbor City, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed July 6, 1970, Ser. No. 52,495
Int. Cl. H03k *5/20*
U.S. Cl. 307—304 **4 Claims**



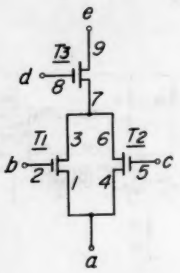
A metal oxide semiconductor field effect transistor (MOSFET) circuit of a type that can be constructed on a single semiconductor substrate. The circuit detects which of three possible conditions is applied to a single input. The circuit will provide a two-bit digital output signal indicative of the input condition. The circuit includes two MOSFET inverters and a MOSFET resistor divider network.

3,609,412

INTEGRATED IGFET SIGNAL CONVERTER CIRCUIT

Tomisaburo Okumura, Kyoto, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan

Filed Sept. 16, 1969, Ser. No. 858,468
Claims priority, application Japan, Sept. 19, 1968, 6897/68
Int. Cl. H011 *19/00*
U.S. Cl. 307—304 **3 Claims**



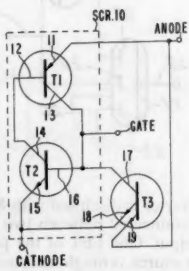
An integrated circuit element comprising two insulated-gate field-effect transistors connected in parallel and another insulated-gate field-effect transistor connected in cascade thereto, which works stably as a converter, e.g. a local oscillator or a frequency converter element in a radio or television receiver and which can be easily designed because few outgoing electrode lead wires are necessary for integration.

3,609,413

CIRCUIT FOR THE PROTECTION OF MONOLITHIC SILICON-CONTROLLED RECTIFIERS FROM FALSE TRIGGERING

Richard Q. Lane, La Honda, and John S. MacDougall, Los Altos, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mt. View, Calif.

Filed Nov. 3, 1969, Ser. No. 874,533
Int. Cl. H02h *7/20*
U.S. Cl. 307—305 **7 Claims**



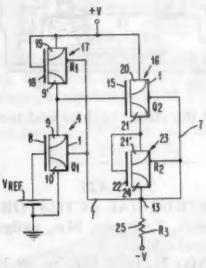
Power supply voltage transients are prevented from turning on a silicon-controlled rectifier by use of a dual-emitter current switch to short circuit a given PN junction within the silicon-controlled rectifier for the duration of each transient.

3,609,414

APPARATUS FOR STABILIZING FIELD EFFECT TRANSISTOR THRESHOLDS

Peter Pleshko, Waldwick, N.J., and Lewis M. Terman, South Salem, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 20, 1968, Ser. No. 753,923
Int. Cl. H03k 17/14
U.S. Cl. 307—310 7 Claims



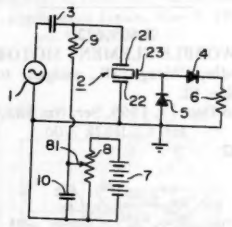
Apparatus is disclosed which permits the adjustment and stabilization of field effect transistor threshold voltages so that the variation in threshold voltages due to fabrication nonuniformities are reduced to a minimum. This is accomplished by utilizing one of a plurality of field effect devices on a semiconductor chip as a sensor to detect changes in the characteristics of the devices, from whatever cause. A feedback circuit provides a signal which adjusts the voltage applied to the semiconductor chip or substrate and returns the threshold voltage to some nominal value. Several circuit arrangements are shown which accomplish the desired result. A plurality of chips each having a sensor and associated feedback circuitry is also disclosed indicating the environment in which the concept of the present invention is used most advantageously.

3,609,415

PIEZOELECTRIC TRANSFORMER CIRCUITS

Takehiko Kawada, Yokohama, Japan, assignor to Denki Onkyo Company Limited, Nishirokug, Ohoto-ku, Tokyo, Japan

Filed July 13, 1970, Ser. No. 54,385
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 8 Claims



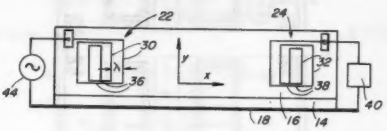
In a piezoelectric transformer circuit wherein a high voltage is produced at the output electrode of the piezoelectric transformer by applying a driving voltage of a frequency equal or close to the resonance frequency of the piezoelectric transformer across the driving electrodes thereof, a DC voltage is impressed upon the driving electrode to vary the resonance frequency to regulate the output voltage characteristics.

3,609,416

MICROACOUSTIC SURFACE-WAVE TRANSDUCER

Max Epstein, Highland Park, Ill., assignor to Northwestern University, Evanston, Ill.

Filed Aug. 12, 1970, Ser. No. 63,131
Int. Cl. H01v 7/00
U.S. Cl. 310—8.2 11 Claims



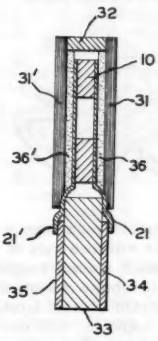
A surface-wave transducer, fulfilling in a single structure the requirements of both electric and acoustic matching. There is also disclosed a convenient technique for the transduction of signals having a wide frequency bandwidth. The transducer used can be produced utilizing simple photoetching techniques and may be employed at extremely high frequencies.

3,609,417

PIEZOELECTRIC CERAMIC RING RESONATOR

Yuichi Kaname, and Kingo Wada, both of Osaka-fu, Japan, assignors to Mitsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Jan. 20, 1970, Ser. No. 4,201
Int. Cl. H01v 7/00
U.S. Cl. 310—9.5 1 Claim



A piezoelectric ceramic resonator adapted for an IF filter comprises a piezoelectric ceramic thin ring having two electrodes applied to opposed major surfaces, and two conductive plates secured to each electrode, each of the conductive plates consisting essentially of a lead stem and a conductive ring similar in the size and shape to the piezoelectric ceramic ring. The ceramic ring is a fundamental resonant frequency of radial vibration mode.

3,609,418

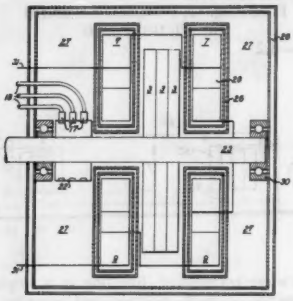
MECHANICAL POWER TRANSMISSION SYSTEMS

Edward Halas, P.O. Box 2682, Detroit, Mich.

Continuation-in-part of application Ser. No. 492,110, Oct. 1, 1965, now Patent No. 3,521,091, dated July 21, 1970. This application Sept. 30, 1969, Ser. No. 862,195
Int. Cl. H02k 9/197, 49/04, 51/00
U.S. Cl. 310—10 22 Claims

A foil strip-type conductor for producing a magnetic field which is immersed in a fluid such as liquid nitrogen or helium cooled to cryogenic temperatures, the liquid being in moving contact with each strip of the conductor. A power transmission system having primary means for producing a magnetic

field which is a superconductive foil coil immersed in a liquid coolant such as helium and secondary means responsive to the magnetic field which is maintained at cryogenic but not

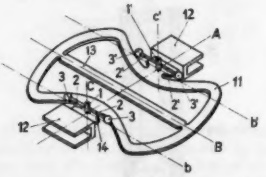


necessarily a superconductive temperature by a liquid coolant such as nitrogen and which rotates within an enclosure containing such coolant.

3,609,419
MECHANICAL RESONATORS FOR STANDARD FREQUENCY OSCILLATORS

Andre Greuter; Arpad Korom, and Peter Donatsch, all of Zurich, Switzerland, assignors to Gesellschaft, zurForderung der Forschung an der Eidgenossischen Technischen Hochschule, Zurich, Switzerland

Filed Jan. 30, 1970, Ser. No. 7,008
Claims priority, application Switzerland, Feb. 5, 1969, 1728/69
Int. Cl. H02k *33/00*
U.S. Cl. 310—25 **18 Claims**



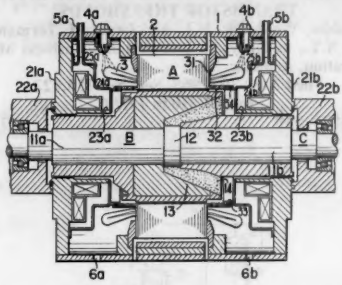
A mechanical resonator comprising a primary vibrator having a spring member with two axes of symmetry at right angles and two vibration masses coupled to the spring member and arranged to vibrate in mutually opposite senses with the centers of vibration thereof arranged to move on a rectilinear path which coincides with one of said axes. An even number of pairs of secondary vibrators are carried by said primary vibrator with at least one pair of said secondary vibrators associated with each of said vibration masses of the primary vibrator. The centers of vibration of the two secondary vibrators which together form each pair are arranged to move with components of motion parallel to the said axis of symmetry coincident with the path of of the vibration masses of the primary vibration which are in the same sense, and with components of motion at right angles to this axis of symmetry which are mutually opposed.

3,609,420
LIQUID-COOLED DYNAMOELECTRIC MACHINES

Junpei Inagaki, Yokohama-shi; Moriyoshi Sakamoto, Yokohama-shi; Tsuneo Nakakita, Kawasaki-shi; Yasuaki Kanda, Tokyo, and Hiroyuki Kitamura, Yokohama-shi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd, Kawasaki-shi, Japan

Filed Sept. 29, 1969, Ser. No. 861,601
Claims priority, application Japan, Oct. 1, 1968, Oct. 1, 1968, Oct. 1, 1968, Oct. 1, 1968, Oct. 1, 1968, 43/70781;43/70873;43/70874;43/70879;43/70880
Int. Cl. H02k *9/19*
U.S. Cl. 310—54 **5 Claims**

A liquid-cooled dynamoelectric machine wherein the rotor is enclosed by a liquid-tight nonmagnetic cylindrical shielding member and cooling liquid is sprayed directly upon high-tem-

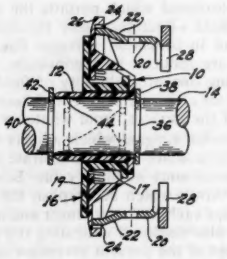


perature portions of the stator such as end turns of the armature winding.

3,609,421
CENTRIFUGAL ACTUATOR

Eugene F. Hildebrandt, Ferguson, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 21, 1970, Ser. No. 39,355
Int. Cl. H02k *11/00*
U.S. Cl. 310—68 **5 Claims**

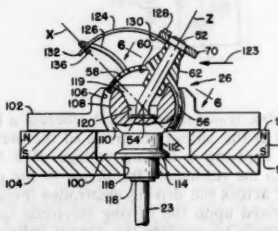


A centrifugal starting switch actuator for AC electric motors mounted on a motor shaft for rotational movement thereon between two angularly spaced stops, there being means providing a light frictional drag between the shaft and actuator, the actuator being positively accelerated to switch actuation speed as the motor is accelerated to running speed by engagement with one of the stops and thereafter at running speed is free to drift between the angularly spaced stops against the light frictional drag as the motor shaft is accelerated and decelerated by motor torque pulses, whereby motor torque pulses which would otherwise rattle hinged actuating members are absorbed.

3,609,422
WOBBLE ELEMENT MOTOR

Robert W. Nordin, Chicago, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 17, 1969, Ser. No. 885,780
Int. Cl. H02k *7/06*
U.S. Cl. 310—82 **27 Claims**



An inductance coil structure of spherical configuration comprises a movable element for driving the motor. It is

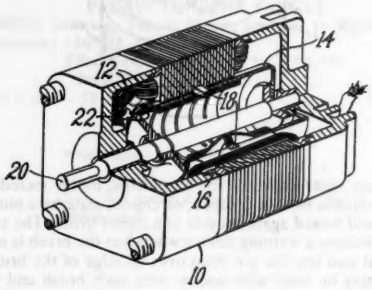
wobbleably mounted concentrically of an angularly offset section of the output shaft of the motor for generating motor output torque responsively to the wobbling. A permanent magnet provides a spherical airgap within which magnetic flux induced by current flow in the coil structure coacts with the flux field of the magnet to wobble the movable element. Serially connected coils of said structure are disposed in opposed quadrants of the configuration to simultaneously push and pull the movable element and produce the wobble movement their in any selected direction, thereby to selectively vary the extent and direction of shaft movement about its axis of rotation.

3,609,423

BRIDGING STRIP FOR DEFLECTABLE ARMATURES

Willard B. Spring, Topsfield, and Walter R. Woodward, Carlisle, both of Mass., assignors to USM Corporation, Boston, Mass.

Filed June 25, 1970, Ser. No. 49,835
Int. Cl. H02k *7/00*
U.S. Cl. 310—82 **5 Claims**



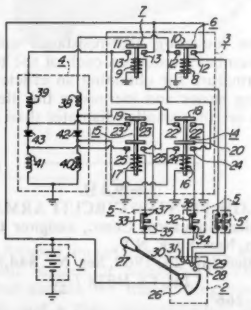
Magnetic material has a unique configuration to reduce reluctance and improve performance of stepping or synchronous motors of the type employing deflectable armatures. Specifically, for instance, to reduce or eliminate nonuniformity of peripheral airgap the outer convolution or a portion thereof of the magnetic strip has its thickness gradually diminishing towards its outer end and/or is provided, at the length of such convolution from its end, with a radial, widthwise extending projection of substantially the same dimension as the thickness of the material at that end. Alternatively, concentric bridging tubes may be employed. A longitudinal slit pattern may be used to reduce eddy currents.

3,609,424

EDDY CURRENT-TYPE RETARDER

Tadao Murakami, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1970, Ser. No. 35,060
Claims priority, application Japan, May 9, 1969, 44/35167
Int. Cl. H02k *49/04*
U.S. Cl. 310—93 **8 Claims**



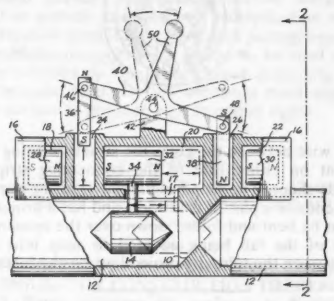
An eddy-current-type retarder wherein individual exciting coils are shiftably connected in series or in parallel with each other to obtain quick deceleration or slow deceleration as desired without degrading the utility of said exciting coils and the electric circuit is so arranged that the function of the retarder is automatically shifted from quick deceleration to slow deceleration within a safe range, as the temperature of said exciting coils rises.

3,609,425

RECIPROCATING MAGNET MOTOR

Francis R. Sheridan, 170-23 Pacific Ave., Spanaway, Wash.

Filed Apr. 7, 1970, Ser. No. 26,324
Int. Cl. H02k *49/10*
U.S. Cl. 310—103 **6 Claims**



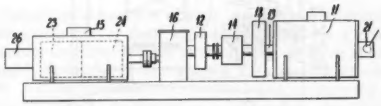
A reciprocating magnetic actuator comprises first and second magnets and mounting means mounting the same in fixed, spaced, aligned relation with unlike poles facing each other. First guide means are interposed between and aligned with the first and second magnets. A third magnet is freely reciprocatable therein, being aligned with the first and second magnets and arranged with its poles facing unlike poles thereof. Stops at each end of the first guide means arrest the reciprocation of the third magnet at predetermined travel limits. Fourth and fifth magnets are interposed between the stops and the first and second magnets respectively. They are arranged substantially normal to the latter with like poles facing the like poles of the third magnet. Reciprocating drive means advance the fourth and fifth magnets alternately into the fields of force of the third magnet, thereby causing its reciprocation in the guide means. The force thus generated is used to drive a selected appliance through a power takeoff carried by the third magnet.

3,609,426

INERTIA-DRIVEN STANDBY ELECTRIC GENERATOR UNIT

Richard Gaul, Metz, Moselle, France, assignor to Paul Racaniere, Nimes, France

Filed Apr. 30, 1969, Ser. No. 820,353
Claims priority, application France, May 17, 1968, 152,176
Int. Cl. H02k *17/44*
U.S. Cl. 310—112 **15 Claims**



A flywheel rotated above the mound speed of a generator is selectively coupled to the generator through a variable-speed clutch upon power failure to keep the generator speed constant during the time it takes to substitute a standby power source.

3,609,427

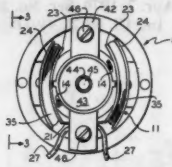
FIELD COIL STRUCTURE FOR ELECTRIC MOTOR

Max E. Lautner, Alexandria Bay, and George Hale Smith, Sackets Harbor, both of N.Y., assignors to Bomax Division, Gould Inc., Watertown, N.Y.

Filed May 13, 1970, Ser. No. 36,766
Int. Cl. H02k *3/52*
U.S. Cl. 310—194 **3 Claims**

An electric motor has a stator ring and a separate stator yoke spaced therefrom and having pole tip projections

adapted to be pressed in place inside the ring. A stator coil supporting structure of bendable plastic has a pair of bobbins with central apertures therethrough in which the pole tip projections are adapted to fit and radially projecting flanges adapted to extend along the inner and outer sides of a coil wound on each bobbin. An integral connecting strip is joined to one side of each inner bobbin flange for supporting the



crossover wire between the coils, the structure being adapted to be bent on either side of the connecting strip into a generally U-shape. The strip has tubular securing portions for the inner ends of a pair of lead wires and has a projecting tab adapted to be bent and folded down over the crossover wire, a portion of the tab being adapted to snap into a recess formed between the tubes by projections on the tubes.

3,609,428

DYNAMO ELECTRIC MACHINE HAVING IMPROVED SLIPRING ASSEMBLY

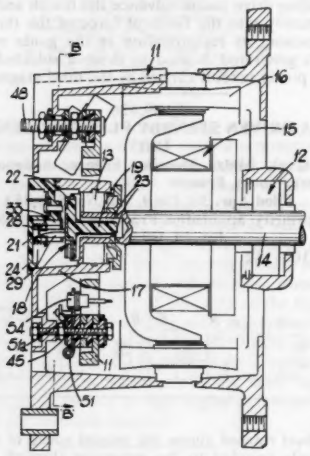
Herbert John Thomas Cotton, "Lea Mount" 195, Alcester Road, Hollywood, and Robert Hemmings, 49 Masters Lane, Halesowen, both of England

Filed Jan. 9, 1970, Ser. No. 1,642

Claims priority, application Great Britain, Jan. 13, 1969, 1880/69

Int. Cl. H01v *39/06*

U.S. Cl. 310—232 **5 Claims**



This invention relates to dynamo electric machines. The dynamo electric machine includes a frame which supports a pair of bearings. A rotor shaft is journaled for rotation in the bearings, and carries a rotor assembly. A slipring assembly is also carried by the rotor shaft, and a brush assembly is provided, the brushes of which engage the slipring assembly. One end of the rotor shaft extends beyond one of the bearings, and is formed with an axial bore. The slipring assembly includes an integral spigot which is engaged as an interference fit in the bore in the rotor shaft, the spigot serving to support the slipring assembly on the rotor shaft so that the slipring assembly rotates with the rotor shaft. The slipring assembly is electrically connected to the rotor windings by way of leads which extend through the bearing, and so rotate with the shaft.

3,609,429

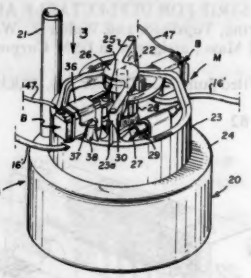
BRUSH WEAR INDICATOR

Harris A. Thompson, P.O. Box 916, Boulder, Colo.

Continuation-in-part of application Ser. No. 714,555, Mar. 20, 1968, now Patent No. 3,523,288. This application Feb. 2, 1970, Ser. No. 7,539

Int. Cl. H02k *13/00*

U.S. Cl. 310—246 **10 Claims**



A brush wear indicator for an electric motor including a switch which is held in an open, or closed, state by a pin contacting and biased against a side of a motor brush. The switch trips to initiate a warning device whenever the brush is nearly worn out and lets the pin drop over an edge of the brush. A switch may be used with one or with each brush and when used with both, either switch will actuate the warning device. The warning device may be a light adapted to burn steadily or it may continually flash by including a flasher means in the warning device circuit.

3,609,430

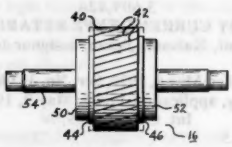
ARMATURE WITH HIGH RESISTANCE END RINGS AND HEAT DISSIPATION ARRANGEMENT

James F. Buffington, R.R. #3, Plymouth, Ind.

Filed Oct. 9, 1969, Ser. No. 864,979

Int. Cl. H02k *1/22*

U.S. Cl. 310—265 **2 Claims**



An armature including high-resistance end rings and a disk-shaped member located on each of the two ends of the core of the armature for obtaining an efficient starting and smooth running motor and increasing the life of the motor. The end rings are of a smaller diameter than the core of the rotor.

3,609,431

HOLLOW PRINTED CIRCUIT ARMATURE

Joshua Lifschitz, Stamford, Conn., assignor to Sperry Rand Corporation, New York, N.Y.

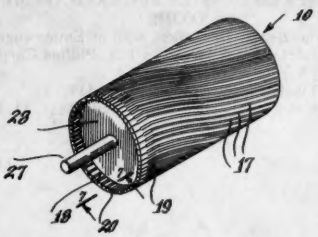
Filed July 25, 1969, Ser. No. 844,884

Int. Cl. H02k *1/22*

U.S. Cl. 310—266 **4 Claims**

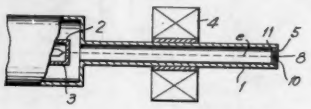
A printed circuit armature wherein the conductors are printed on one face of an insulated support member, and

which member is adapted to be folded into opposing leaf por-



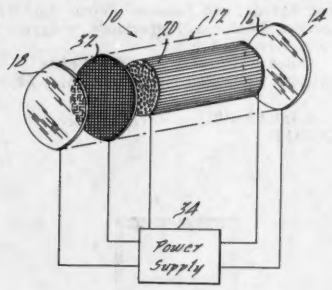
tions and then rolled into a cylinder whereby the conductors are arranged on the inner and outer surfaces of the cylinder.

3,609,432
THIN TARGET X-RAY TUBE WITH MEANS FOR PROTECTING THE TARGET
Yoshihiro Shimula, Tokyo, Japan, assignor to Rigaku Denki Company Limited, Tokyo, Japan
Filed Nov. 8, 1968, Ser. No. 774,396
Int. Cl. H01j *35/08, 35/16, 35/33*
U.S. Cl. 313—59 **11 Claims**



In X-ray tubes having thin targets such as foils, a problem is encountered in the deterioration of the foils, due to heat caused by bombardment by an electron beam. The invention avoids this deterioration in accordance with the one embodiment by providing water-cooled blocks in contact with the target and provided with openings through which the electron beam and/or emitted X-rays can pass and in accordance with another embodiment by providing an antioxidizing coating on the target.

3,609,433
PROXIMITY-FOCUSED IMAGE STORAGE TUBE
M. David Freedman, Southfield, Mich., assignor to The Bendix Corporation
Filed Sept. 29, 1969, Ser. No. 861,748
Int. Cl. H01j *31/26, 31/50*
U.S. Cl. 313—65 R **5 Claims**

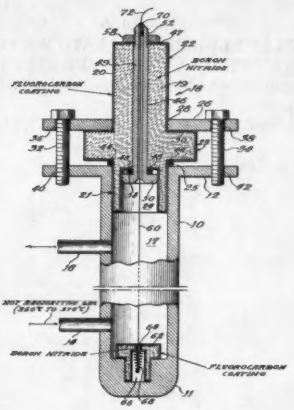


A proximity-focused image storage tube having a high-potential readout surface, a passageway structure spaced from the readout surface for transmitting electrons to the readout surface, and a thin, nonconductive charge storage surface formed on the input end of the passageway structure. The passageway structure comprises an array of glass tubes. A first conductive surface is disposed on the input end of the array between the glass tubes and the storage surface. A second conductive surface is formed on the output end of the array. Voltage potentials are maintained on these conductive surfaces. The voltage potential of the second surface isolates the storage surface from the field produced by the high-potential readout surface so that the storage surface can be placed very close to the high-potential readout surface. The storage tube described herein therefore provides a highly focused output image because readout electrons will travel only short distances from one surface to another and therefore have little opportunity to defocus. A potential gradient is maintained between the two conductive surfaces during readout to provide both electron multiplication and a collimated electron output flow from each passageway. The electron multiplication allows an image to be read out of this tube for a relatively long time without degrading the stored image because relatively few electrons need approach the storage surface to produce a given output signal.

ERRATA

For Classes 313—70 and 313—82 see:
Patent Nos. 3,609,400 and 3,609,401

3,609,434
HIGH-TEMPERATURE PROPORTIONAL COUNTER AND INSULATOR CONSTRUCTION THEREFOR
Daniel S. Berry, Chicago, Ill., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.
Filed July 19, 1967, Ser. No. 654,601
Int. Cl. H01j *39/26, 39/28*
U.S. Cl. 313—93 **5 Claims**

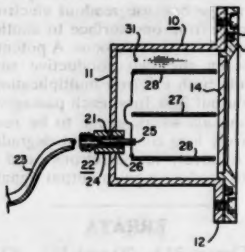


A boron nitride core is coated with polytetrafluorethylene (Teflon) or a similar fluorocarbon resin to form a composite gas-sealant insulator for use at temperatures up to about 370° C., highly resistant to mechanical deformation or chemical attack. A flow proportional counter incorporating the insulator construction is employed as a detector in gas chromatography.

3,609,435
FAST-RESPONSE IONIZATION CHAMBER FOR DETECTING IONIZING RADIATION FROM 0.1 TO 60 ANGSTROMS
Randolph G. Taylor, Washington, D.C., and John Lewis, Jr., Falls Church, Va.
Filed Oct. 30, 1968, Ser. No. 771,793
Int. Cl. H01j *39/26, 39/28*
U.S. Cl. 313—93 **4 Claims**

This invention is directed to an ionization chamber having a rectangular housing including therein spaced anode plates with a centrally located cathode. This ionization chamber has a fast response for detection of ionizing radiation in various bands from 0.1 to 60A depending on the gas filling and win-

dow material (for example 0.5–3.0A uses a 50-mil-thick beryllium window and 2 atm, of krypton) with a fast recovery. Fast response is brought about by the relationship of the cathode to the anodes in which the spacing and electric field is uniform along the length of and on opposite sides



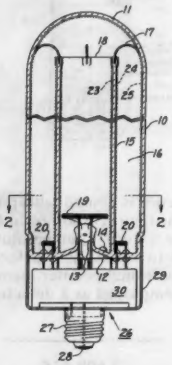
of the cathode. The chamber is filled with a gaseous filling selected from one of the following, nitrogen, carbon tetrachloride, xenon, nitrogen, krypton or argon and is provided with a removable beryllium, Mylar or aluminum window through which the ionizing radiation enters the chamber.

3,609,436

FLUORESCENT LIGHT SOURCE WITH A PLURALITY OF SEQUENTIALLY ENERGIZED ELECTRODES

John H. Campbell, Mentor, Ohio, assignor to General Electric Company

Filed Apr. 21, 1969, Ser. No. 817,736
Int. Cl. H01j *7/04*
U.S. Cl. 313—204 **6 Claims**



This invention relates to a fluorescent lamp with an elongated discharge path of annular or flat cross section and with a multiplicity of at least four sequentially energized electrodes at one end of the discharge path in combination with switching means, preferably of the solid state-type for energizing the electrodes.

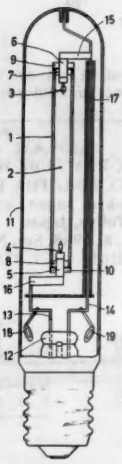
In a preferred embodiment of the invention the lamp has a single base at one end and the auxiliary equipment for operating the lamp is arranged within the lamp base.

3,609,437

ELECTRIC DISCHARGE LAMP COMPRISING CONTAINER OF DENSELY SINTERED ALUMINUM OXIDE

Taeke Tol, and Bertus De Vrijer, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 8, 1968, Ser. No. 711,763
Claims priority, application Netherlands, Mar. 31, 1967, 6704681
Int. Cl. H01j *17/16*
U.S. Cl. 313—220 **11 Claims**



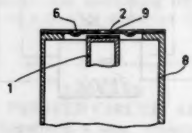
Electric gas discharge lamp having an envelope of densely sintered aluminum oxide and employing an alkali metal vapor as the discharge medium. A current supply member for an electrode assembly is sealed in each end of the envelope by means of a sealing element of densely sintered aluminum oxide which is sintered to the inner wall of the envelope and is provided with an aperture into which a cylindrical current lead-in supporting at one end an electrode assembly is secured in a gastight manner. The current lead-in member is provided with a cover for the envelope which is sealed to the latter by a sealing glass having a melting point higher than 800° C. and lower than the melting point of the aluminum oxide or the current supply member.

3,609,438

ELECTRON GUN WITH NICKEL GRID PLATE AND COPPER-NICKEL ALLOY GRID CYLINDER

Johannes Van Esdonk, and Johannes Petrus Hornman, both of Emmasingel, Eindoven, Netherlands, assignors to U.S. Philips Corp., New York, N.Y.

Filed May 5, 1970, Ser. No. 34,650
Claims priority, application Netherlands, May 24, 1969, 6908004
Int. Cl. H01j *1/14, 1/48, 19/06*
U.S. Cl. 313—311 **3 Claims**



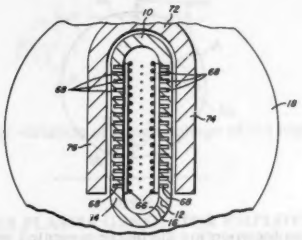
An electron gun the first perforated electrode of which, which surrounds the cathode, consists of a perforated plate of nickel which is secured to a cylinder consisting of a copper-nickel alloy. (FIG. 3.)

3,609,439

ANODE HAVING SPACED CAVITIES FOR SUPPRESSION OF SECONDARY EMISSION

Barry M. Singer, New York City, N.Y., assignor to The Machlett Laboratories, Incorporated, Springdale, Conn.

Filed Feb. 27, 1969, Ser. No. 802,797
Int. Cl. H01j *1/36, 1/40, 43/28*
U.S. Cl. 313—352 2 Claims



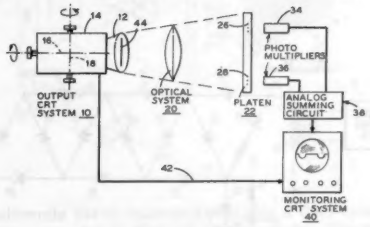
A magnetically focused beam power tube having an anode provided with means for suppressing secondary emission, which means comprises Faraday cage-type cavity structures having magnetic shielding for providing substantially magnetic-free regions within the cavities.

3,609,440

METHOD FOR ALIGNING A SCANNING LIGHT BEAM ON A PLATEN

Ronald F. Cooper, Warrenton, Va., assignor to Alphanumeric Inc., Lake Sucess, N.Y.

Filed May 26, 1969, Ser. No. 827,527
Int. Cl. H01j *29/70*
U.S. Cl. 315—10 1 Claim



A horizontal line trace on the face of a first cathode-ray tube display is projected onto a platen. The image of the trace is to sweep over a given line on the platen. The given line is defined by two displaced nonuniformly contoured apertures in the platen. The light passing through the apertures is visually displayed as waveforms on a monitoring cathode-ray tube display and the first cathode-ray tube display is repositioned in accordance with the displayed waveforms until particular waveforms are displayed indicating the image of the trace is sweeping over the given line on the platen.

3,609,441

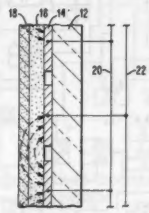
FIELD-EFFECT VIEWING STORAGE TUBE

Euval S. Barrekette, New York City, N.Y., and Herbert B. Baskin, Yorktown, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 16, 1969, Ser. No. 833,445
Int. Cl. H01j *29/22*
U.S. Cl. 315—12 8 Claims

An improved halftone charge-controlled viewing storage tube which uses the field-effect principle is described. The tube is characterized as having as its face plate a panel comprising a light transparent support plate, a light transparent conductive coating on one side of such support plate a first electroluminescent material layer disposed over the conductive coating and a layer of a uniform mixture of a second electroluminescent material and a photoconductor is disposed over the first electroluminescent layer. The first electroluminescent material is selected to emit light in the visible range of the electromagnetic spectrum, while the second electroluminescent material is sealed to emit light in the near ultraviolet region of the electromagnetic spectrum.

Large panels 12 × 12 inches and larger can be used to give sharp clear images. Additionally, high writing speed is obtained in the storage tube. Information can be stored or can be disposed without being stored. Also, the storage tube is capable of providing long viewing times.

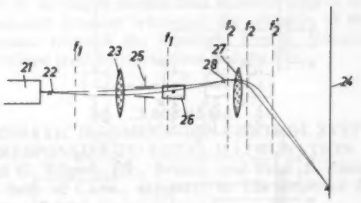


3,609,442

CATHODE-RAY TUBE WITH INCREASED DEFLECTION SENSITIVITY

Klaus Schaffernicht, Ulm an der Danube, Germany

Continuation of application Ser. No. 482,533, Aug. 25, 1965, now abandoned. This application Dec. 12, 1968, Ser. No. 785,049
Claims priority, application Germany, Aug. 27, 1964, T26891
Int. Cl. H01j *29/46, 29/56*
U.S. Cl. 315—17 17 Claims



A cathode-ray tube provided with an electron gun and a target electrode as well as a first image-forming lens, disposed in the path of the electron beam produced by the gun, for producing an intermediate image of the cross section of a selected point along the beam, which image is no greater than three times as large as the beam cross section, and a second image-forming lens disposed in the path of such beam downstream of the first lens in the direction in which such beam is traveling, for reproducing such intermediate image on the target electrode.

3,609,443

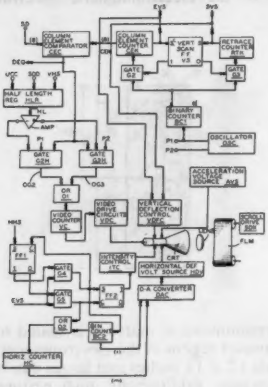
DUAL RESOLUTION GRAPHIC SYMBOL GENERATOR

Solomon Manber, Sands Point, N.Y., assignor to Alphanumeric, Incorporated, Lake Success, N.Y.

Filed Apr. 1, 1969, Ser. No. 812,058
Int. Cl. H01j *29/70*
U.S. Cl. 315—18 15 Claims

A graphic symbol generator includes a cathode-ray tube assemblage disposed opposite a photosensitive film. The electron beam of the cathode-ray tube assembly while being driven in a raster scan mode, is intensity modulated in accordance with stored coded combinations of binary signals

which represent the graphic symbol. Provisions are made to control the line density or resolution of the scan in two



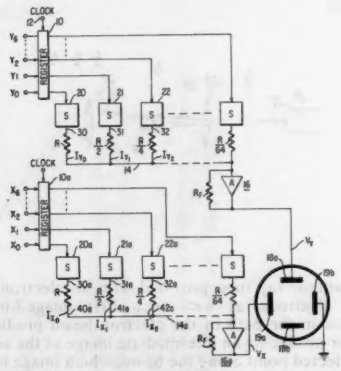
dimensions during the generation of the graphic symbol as an array of parallel line segments.

3,609,444

CONSTANT TIME STROKE GENERATOR

Raymond Charles Van Den Heuvel, Northridge, Calif., assignor to RCA Corporation

Filed June 6, 1969, Ser. No. 831,130
Int. Cl. H01j *29/70*
U.S. Cl. 315—18 **7 Claims**



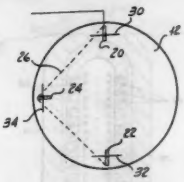
A plurality of waves are produced, each in response to a different digit of a binary number. A wave may be of constant amplitude and have one of two values or may be increasing or decreasing from one of these values to the other depending upon whether, since a preceding time interval, the digit represented by the wave has not or has changed its value. The waves are added, each with a weight corresponding to a different power of two, to provide the deflection waveform to be applied, for example, to the X-deflections means of a cathode-ray tube. In analogous fashion, the weighted sum of a second plurality of waves serves as the deflection waveform for the Y-deflection means of the cathode-ray tube.

3,609,445

ELECTRONIC IMAGE STABILIZATION SYSTEM

Peter R. Williams, Wilton, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed May 14, 1969, Ser. No. 824,573
Int. Cl. H01j *29/76*
U.S. Cl. 315—21 R **15 Claims**



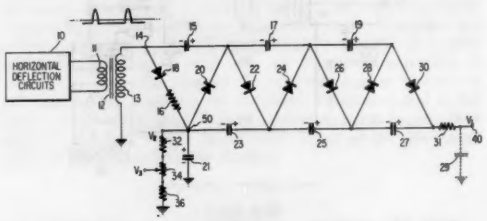
A system for orienting the image presented on the face of a display tube in which time error signals indicating vertical, lateral and rotational displacements of the image, produced by comparing internally generated reference pulses with sense pulses generated as the electron beam passes over electrodes in the tube face, are then converted to analogue voltage error signals which are fed to the tube deflection system to restore the image to a predetermined orientation on the tube face.

3,609,446

POWER SUPPLY UTILIZING A DIODE AND CAPACITOR VOLTAGE MULTIPLIER FOR TRACKING FOCUSING AND ULTOR VOLTAGES

Neal Wesley Hursh, and John Joseph McArdle, both of Indianapolis, Ind., assignors to RCA Corporation

Filed June 2, 1969, Ser. No. 829,499
Int. Cl. H01j *29/56*
U.S. Cl. 315—31 **8 Claims**



A television receiver high voltage power supply includes an ultor voltage output and an output voltage at some potential lower than the ultor voltage. The supply is responsive to kinescope beam current to vary the proportionate magnitudes of the high and lower voltages at some predetermined ratio.

3,609,447

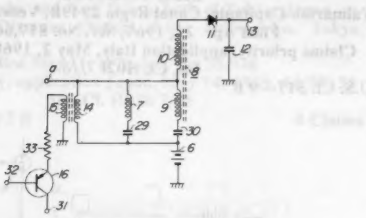
HIGH VOLTAGE REGULATION CIRCUIT FOR A COLOR TELEVISION RECEIVER

Ryoichi Hirota, Yokohama; Tooru Fujishima, Yokohama; Gentaro Miyazaki, Fujisawa-shi; Tadahiko Iwasaki, Kamakura-shi; Mitsuharu Akatsu, Yokohama, and Tomoo Kinoshita, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 21, 1969, Ser. No. 809,244
Claims priority, application Japan, Mar. 27, 1968, 43/19393
Int. Cl. H01j *29/76*
U.S. Cl. 315—27 **18 Claims**

A high-voltage regulation circuit for a color television receiver comprising a horizontal deflection yoke, a high-voltage circuit and a variable inductance element connected in

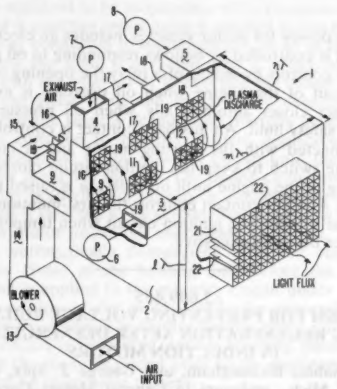
parallel with said horizontal deflection yoke, thereby controlling the inductance of said variable inductance element in response to the variation of a high voltage of the high-voltage circuit.



3,609,448
HIGH-POWER PLASMA GENERATOR EMPLOYED AS A SOURCE OF LIGHT FLUX AT ATMOSPHERIC PRESSURE

Norman H. Williams, San Francisco, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Jan. 14, 1970, Ser. No. 2,709
Int. Cl. H01j *7/46, 19/80*
U.S. Cl. 315—39 **8 Claims**



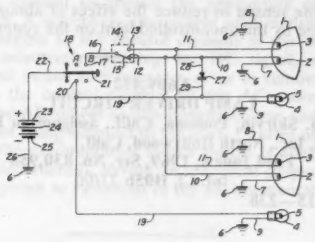
A multimode cavity resonator includes a duct system for directing a gas stream through the resonator. Electromagnetic power is supplied to the resonator for establishing a plasma discharge in the air stream within the resonator. Light flux generated by the plasma at atmospheric pressure is transmitted through an optically transparent wall portion of the cavity to a utilization region outside of the cavity. The gas ducts and the optically transparent wall of the cavity include a cluster of conductive tubes dimensioned to be cut off at the operating frequency of the cavity.

3,609,449
VEHICLE HEADLIGHTING AND STANDBY PARKING LIGHT SYSTEM

Joseph F. Vercellotti, Novelty, Ohio, assignor to General Electric Company

Filed Feb. 6, 1969, Ser. No. 797,047
Int. Cl. B60g *1/04*
U.S. Cl. 315—82 **5 Claims**

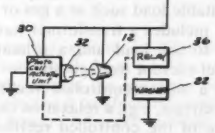
In a vehicle headlighting system including a head lamp and a parking lamp each containing a filament, along with a conventional two-position main switch for selectively operating either the parking lamp or the head lamp, a junction diode is connected across the hot sides of the filaments in the respective lamps so as to block current passage through the head lamp filament but permit current passage through the parking lamp when the main switch is in the first one of its two operating positions, and permit current passage through both the head lamp and the parking lamp when the main switch is in the second one of its two operating positions, thereby assuring continued operation of the parking lamp in the event the head lamp filament should become ruptured and the head lamp rendered inoperative.



3,609,450
AUTOMATIC HEADLIGHT-WASHING SYSTEM

Atlee S. Hart, Huntington Woods, Mich., assignor to Lindor Electronics, Inc., Huntington Woods, Mich.

Filed Feb. 20, 1969, Ser. No. 800,930
Int. Cl. F21m *3/00;* **B60s** *1/56;* **G05b** *11/16*
U.S. Cl. 315—82 **8 Claims**

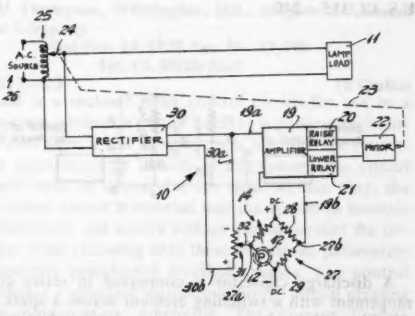


A vehicle headlight washer that is automatically actuated by a photocell actuator whenever the intensity of the light being passed through the headlight lens is reduced to a predetermined level by road grime and the like.

3,609,451
AUTOMATIC ILLUMINATION CONTROL SYSTEM RESPONSIVE TO TOTAL ILLUMINATION

Raymond G. Edgerly, Jr., Bristol, and Peter J. Zanini, Jr., Avon, both of Conn., assignors to The Superior Electric Company, Bristol, Conn.

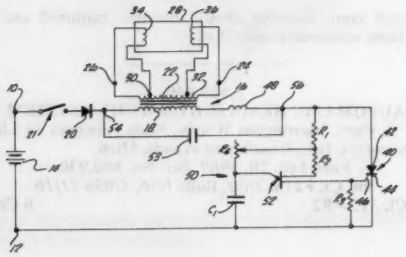
Filed Feb. 16, 1968, Ser. No. 706,128
Int. Cl. H05b *37/02, 41/36, 34/64*
U.S. Cl. 315—151 **2 Claims**



A system for sensing the total amount of illumination in an area from both uncontrolled and controlled sources and au-

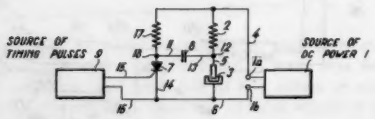
tomatically adjusting the amount of artificial light supplied to maintain a substantially constant value of total illumination and in which the system enables the relative adjusting of the importance of the uncontrolled light to the controlled light that is being sensed to reduce the effect of abnormal conditions caused by the uncontrolled light on the system.

3,609,452
LAMP DRIVER CIRCUIT
Clifford D. Skirvin, Pomona, Calif., assignor to Radiant Industries, Inc., North Hollywood, Calif.
Filed June 6, 1969, Ser. No. 830,958
Int. Cl. H05b *37/00*
U.S. Cl. 315—238 **21 Claims**



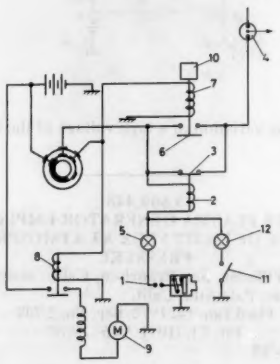
An inverter or converter circuit is described for controlling the power to a suitable load such as a gas or vapor discharge lamp. The circuit includes a transformer having a secondary winding coupled to the load and a primary winding connected to a direct-current voltage source by a controlled rectifier such as a silicon-controlled rectifier. A variable-frequency trigger circuit, e.g., a relaxation oscillator, controls the switching rate of the controlled rectifier and the magnitude of the power delivered to the load. An inductive reactance independent of the transformer is connected in series with the primary winding. A capacitive reactance is connected in parallel with the inductive reactance and primary winding to form a resonant tank circuit for providing commutation of the switching device independently of the load impedance.

3,609,453
CIRCUIT ARRANGEMENT FOR PRODUCING INTERRUPTED CURRENT FOR ELECTRICAL SPARK APPARATUS
Jan Hladik, Nove Mesto Nad Vahom, Czechoslovakia, assignor to Vyskumny ustav mechanizacie a automatizacie, Nove Mesto nad Vahom, Czechoslovakia
Filed Dec. 30, 1968, Ser. No. 787,701
Int. Cl. B23k *1/00, 1/08*
U.S. Cl. 315—240 **10 Claims**



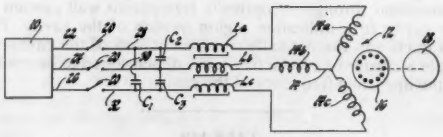
A discharge capacitor is connected in series circuit arrangement with a switching element across a spark gap and provides pulses of opposite polarity from pulses supplied to the spark gap by a power source via a resistor. A charging resistor is connected to a common point in the connection between the switching element and the discharge capacitor.

3,609,454
ANTISEIZING SAFETY DEVICE FOR MOTOR OR THE LIKE VEHICLES
Valmarino Capitanio, Canal Regio 2949B, Venezia, Italy
Filed Apr. 21, 1969, Ser. No. 817,668
Claims priority, application Italy, May 2, 1968, 61567/68
Int. Cl. H02l *7/18*
U.S. Cl. 317—9 B **2 Claims**



A safety device for motor vehicles includes an electric contact which is controlled by bellows responding to oil pressure and which controls by means of a relay the opening of the ignition circuit of the engine when oil pressure is excessive. The contact closes automatically when oil pressure drops below the safety limit. An auxiliary contact is controlled by a relay connected with the starting motor and is connected with a time switch to keep the ignition circuit closed during the starting of the engine until oil pressure is raised to a normal value. Another contact controls the first-mentioned relay and is used to open the ignition circuit when temperature of oil or water becomes excessive.

3,609,455
SYSTEM FOR PREVENTING VOLTAGE BUILDUP DURING REGENERATION AFTER DEENERGIZATION IN INDUCTION MOTORS
Jalal T. Salihi, Birmingham, and George J. Spix, Clawson, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 4, 1970, Ser. No. 8,560
Int. Cl. H02h *9/00*
U.S. Cl. 317—13 R **4 Claims**



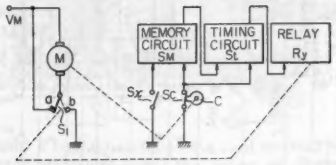
A system for the prevention of voltage buildup in an induction motor which may be caused by the interchange of energy between capacitors connected across the motor winding and the motor winding after the motor is deenergized. In this system, saturable reactors are connected between the capacitors and the motor winding to prevent voltage buildup. The reactors are saturated by voltage supplied from the power source while the motor is energized thus providing minimum impedance to current supplied to the motor. On the other hand, the initial regeneration voltage of the motor when it is disconnected from the supply is inadequate to cause saturation of the reactors. Accordingly, the reactors prevent the interchange of energy between the motor winding and the capacitors, thereby precluding the generation of destructive voltages during periods of regeneration.

3,609,456

ELECTRIC CIRCUIT FOR PREVENTING THE BURNING OF AN ELECTRIC MOTOR

Masao Kayaguchi, and Yuji Ikuno, both of Tokyo, Japan, assignors to Olympus Optical, Ltd., Shibuya-ku, Tokyo, Japan

Filed May 11, 1970, Ser. No. 35,974
Claims priority, application Japan, May 14, 1969, 44/37130
Int. Cl. H02h 7/08
U.S. Cl. 317—13 R 4 Claims



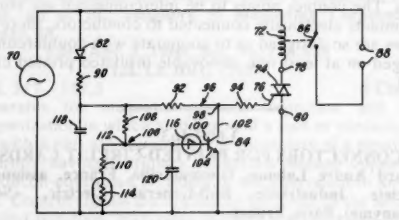
Electric circuit for preventing the burning of an electric motor energized by an electric source through the electric circuit. The electric circuit has a memory circuit actuated by a setting input pulse and reset by a resetting input pulse, a timing circuit connected to said memory circuit so as to be actuated thereby when the same is actuated while the timing circuit is rendered to be inoperative when the memory circuit is reset or a resetting input pulse is applied to the timing circuit, a relay connected to the timing circuit so as to be energized when the same is actuated, and a switch operatively coupled with the relay so as to energize the motor when the relay is energized while the motor is deenergized by the switch when the relay is deenergized, thereby permitting the motor to continue to be driven upon application of the setting input pulse to the memory circuit until the resetting input pulse is applied thereto. The timing circuit comprises a monostable multivibrator having a predetermined holding time which is selected to be suitable for preventing the burning of the motor under the overloaded condition. Thus, the motor is automatically deenergized after the energization thereof by virtue of the holding time before the resetting input pulse is applied to the memory circuit under the overloaded condition of the motor, while the reenergization of the motor by applying a further setting input pulse to the memory circuit is prevented until a resetting input pulse is applied to the memory circuit prior to the application of the further setting input pulse thereto.

3,609,457

THERMAL PROTECTIVE SYSTEM UTILIZING FAULT-RESPONSIVE SHUNT MEANS FOR A NORMALLY CONDUCTING TRIAC

David J. Squiers, Attleboro Falls, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1969, Ser. No. 828,889
Int. Cl. H02h 7/08, 5/04
U.S. Cl. 317—13 C 6 Claims



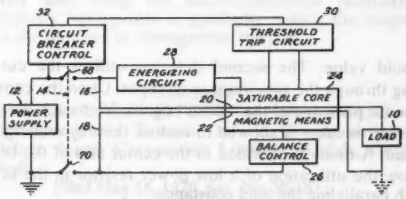
A protective system is disclosed for selectively controlling power supplied to a load in response to variations in a sensed environmental parameter, such as temperature. The system includes an AC power switch, having a control element for controlling its conduction. The AC power switch is serially connected to a load to supply power thereto, when the AC power switch is conductive, while a DC signal is applied to the control element to control the conduction of the AC power switch. A selectively energizable unidirectional switch means is coupled to the control element of the AC power switch for selectively shunting the DC signal, when the unidirectional switch is conductive, so as to remove the DC signal from the control element of the AC power switch, rendering the AC power switch nonconductive and disrupting the power being supplied to the load. Control of the conduction of the unidirectional switch means is effected by a sensor coupled thereto, having an electrical property which varies in response to variations in the environmental parameter.

3,609,458

ELECTRONIC SAFETY SYSTEM

Thomas C. Penn, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 15, 1970, Ser. No. 37,562
Int. Cl. H02h 3/28
U.S. Cl. 317—18 D 14 Claims



An electronic safety system is disclosed for detecting leakage of electrical signals from a load circuit to ground in order to selectively disrupt the supply of power to the load circuit. A pair of electrical conductors couple the load circuit to the source of power. Adjacent sections of the electrical conductors intermediate the load circuit and the power supply are inductively coupled to a selectively energizable saturable core magnetic means, which is connected to an energizing circuit adapted to establish a magnetic field within the saturable core magnetic means. Means are coupled to the saturable core magnetic means for sensing affects on the magnetic field resulting from the presence of unequal currents in the adjacent sections of the conductors, the unequal currents being due to the leakage of current from one of the conductors to ground. Such affects generate an electrical output signal, which may be utilized for effecting operation of a circuit breaker to disrupt the power being supplied to the load.

3,609,459

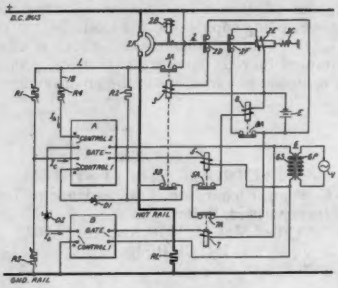
VARIABLE VOLTAGE COMPENSATED LOAD MEASURING CIRCUITS FOR CONTROLLED CLOSURE OF SINGLE-POLE DEVICES

Samuel A. Thompson, Wilmington, Del., assignor to General Electric Company

Filed Feb. 24, 1970, Ser. No. 13,430
Int. Cl. H02h 3/26
U.S. Cl. 317—23 15 Claims

Disclosed is a recloser relay control circuit for use in a traction system wherein a circuit breaker supplies direct current to a load from a bus supplied by a high-voltage source. Upon the occurrence of a fault in the system, the circuit breaker will open to deenergize the load. At this time, the recloser control circuit is inserted into the system to monitor the load resistance and source voltage and to prevent the circuit breaker from reclosing until these monitored parameters attain respective preselected threshold values. The control circuit includes a modified wheatstone bridge circuit utilizing a voltage-compensating subcircuit. The current flowing through the center arm of the bridge, which is a function of the source voltage and the load resistance, and the current

flowing through the subcircuit, which is a function of source voltage alone, are algebraically combined in a first detector which provides a "close" signal when the load resistance is equal to or greater than the preselected threshold value. A second detector is utilized to provide a "close" signal when the source voltage equals or exceeds the preselected



threshold value. The second detector utilizes the current flowing through the subcircuit as its input. Upon the contemporaneous presence of the "close" signals from each detector the circuit breaker is allowed to reclose thereby reenergizing the load. A diode is provided in the center arm of the bridge to allow the utilization of a low power resistor in the bridge branch paralleling the load resistance.

3,609,460

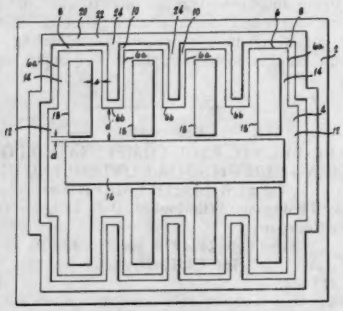
POWER TRANSISTOR HAVING BALLASTED EMITTER FINGERS INTERDIGITATED WITH BASE FINGERS

Joel Ollendorf, Springfield, and Frederick P. Jones, Flemington, both of N.J., assignors to RCA Corporation

Filed June 28, 1968, Ser. No. 740,905

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **5 Claims**



A transistor with interdigitated emitter and base fingers in which the emitter has a web portion for feeding current to the fingers, metal layers on both web and fingers, the finger portion metal layers being spaced from the web portion metal layer to introduce ballasting resistance, and the ends of the base fingers being spaced from the web metallizing a considerably greater distance than the spacing between emitter finger metallizing and the emitter-base junction.

3,609,461

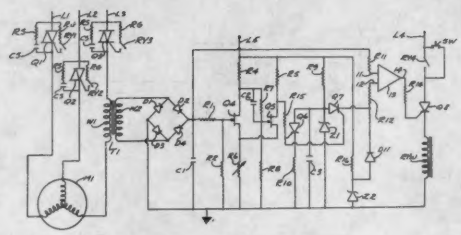
APPARATUS FOR PROTECTING SEMICONDUCTOR DEVICES UTILIZING A TIME-VAPYING REFERENCE SIGNAL

Robert E. Obenhaus, South Easton; Lyle E. McBride, Jr., Norton, and Irvin H. Farley, Attleboro, all of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed July 8, 1968, Ser. No. 743,193

Int. Cl. H02h *3/08, 7/10*

U.S. Cl. 317—33 SC **16 Claims**



Apparatus is described which measures an actual operating parameter of a gated semiconductor device while that device is being operated to control the energization of an electrical load and which causes the device to be deenergized if the value of the parameter exceeds a desired limiting value thereby preventing the device from being operated in an undesired mode.

3,609,462

INTERCONNECTION DEVICE FOR ELECTRONIC SYSTEMS

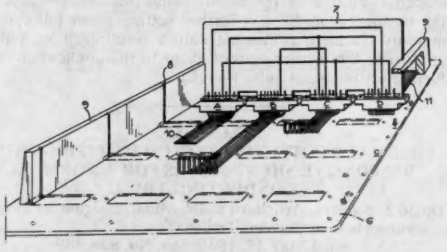
Ruy Francisco Menino De Barros, 1, Avenue de Mars, Brussels, Belgium

Filed June 26, 1968, Ser. No. 740,313

Claims priority, application Belgium, Mar. 27, 1968, 56,373

Int. Cl. H02b *1/04;* **H05k** *1/04*

U.S. Cl. 317—101 **2 Claims**



An interconnection device for electronic systems which is intended to establish interchangeable combinations of electrical connections between at least two groups of contact points. The contact points to be interconnected are connector contacts electrically connected to conductors, these connectors are so designed as to cooperate with countercontacts arranged on at least one removable insulated printed circuit board.

3,609,463

CONNECTORS FOR PRINTED-CIRCUIT CARDS

Bernard Andre Laboue, Goussainville, France, assignor to Societe Industrielle Bull-General Electric, (Societe Anonyme), Paris, France

Filed Sept. 22, 1969, Ser. No. 859,748

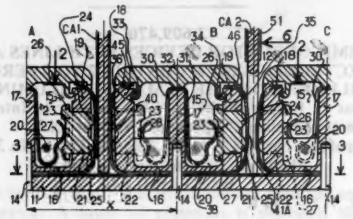
Claims priority, application France, Oct. 1, 1968, 168305

Int. Cl. H02b *1/02;* **H05k** *1/04*

U.S. Cl. 317—101 DH **7 Claims**

An arrangement for connecting circuits of printed-circuit cards to circuits of a connection panel, comprising connec-

tors fixed in parallel relationship to one another on said connection panel, each connector being provided with contact blades of which one end is soldered to a conductive surface of the connection panel and each of which is arranged to be



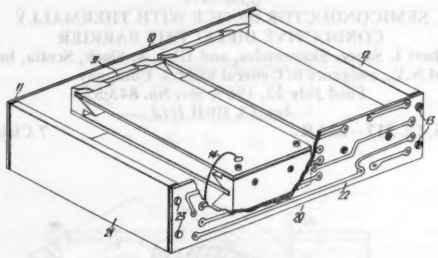
pressed against a contact surface on a card inserted between two connector elements, under the action of an insulating push member pushed by a spring independent of the contact blade.

3,609,464

CHASSIS FOR MOUNTING PRINTED CIRCUIT BOARDS

Dennis Stone, Edmonton, London, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 30, 1969, Ser. No. 862,420
Claims priority, application Great Britain, Oct. 2, 1968, 46706/68
Int. Cl. H02b *1/02*
U.S. Cl. 317—101 DH **8 Claims**



A chassis is provided for printed circuit boards. This chassis includes a framework in two sections which when connected provide a means for mounting the boards in a closely packed manner. The framework is easily separated by taking out removable fasteners to provide access to the boards for servicing.

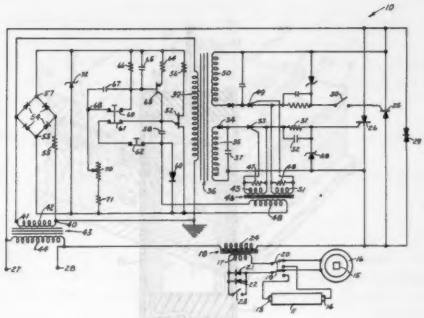
3,609,465

MAGNETIC PARTICLE INSPECTION AND DEMAGNETIZING APPARATUS

Ralph W. Gruetzmacher, River Grove; Kenneth W. Schroeder, Arlington Heights, and Bruce G. Isaacson, Park Ridge, all of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed Apr. 3, 1968, Ser. No. 718,429
Int. Cl. H01f *13/00*
U.S. Cl. 317—157.5 **4 Claims**

Apparatus for magnetic particle inspection and also demagnetization in which a coil around a part or contacts engaged with a part are coupled to the secondary of a stepdown transformer having a primary connected through oppositely poled silicon-controlled rectifiers or the equivalent to an AC source. Control signals are applied to the gates of the silicon-controlled rectifiers, preferably through a second pair of silicon-controlled rectifiers triggered by a unijunction transistor oscillator the timing of which is controlled to control either magnetizing or demagnetizing current. In magnetizing, an AC field is applied to the part which is always discontinued at the end of a half cycle with a steep wave shape such that the remnant magnetization from one part to another is uniform and the degree of concentration of particles over a defect provides an accurate indication of the character of the defeat. In demagnetization, a circuit including a capacitor is



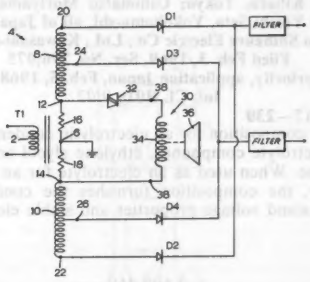
provided for gradually reducing the rate of operation of the oscillator and firing the silicon-controlled rectifiers at progressively later points to gradually reduce the magnetic field in the part and to demagnetize the part.

3,609,466

POWER SUPPLY WITH DEGAUSSING MEANS

Sotos M. Theodoulou, Toronto, Ontario, Canada, assignor to Clairtone Sound Corporation Limited, Rexdale, Ontario, Canada

Filed May 18, 1970, Ser. No. 38,183
Int. Cl. H01f *13/00*
U.S. Cl. 317—157.5 **4 Claims**



A power supply in which the secondary winding of the power transformer is split into two halves, and two thermistors are provided, one connected between each half winding and ground. A degaussing circuit, consisting of a degaussing coil and a voltage dependent resistor, is connected across the thermistors to produce an AC degaussing voltage centered about ground. Since the thermistors have identical characteristics, the power supply is not unbalanced.

3,609,467

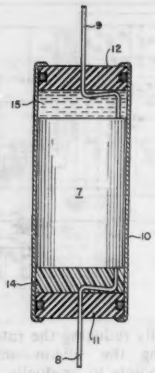
ELECTROLYTIC CAPACITOR AND ELECTROLYTE MATERIAL THEREFOR

James H. Curtis, Columbia, S.C., assignor to General Electric Company

Filed Apr. 17, 1970, Ser. No. 29,509
Int. Cl. H01g *9/02*
U.S. Cl. 317—230 **16 Claims**

A substantially nonaqueous liquid electrolyte for electrolytic capacitors consisting essentially of a major proportion of a solvent such as ethylene glycol, a minor proportion of an ionogen which is the reaction product ester of an organic base and of an acid such as a mono-, di-, or tri-basic organic acid, or the hydroxy substituted derivatives of these acids, the ionogen preferably being dimethylethanolamine

adipate (DMEA), and a small but effective amount of an alkanolamine phosphate. The concentration of the ester in the electrolyte can be from about 0.1%–25% by weight. The concentration of the alkanolamine phosphate may be about



0.1%–6.0% by weight. The electrolyte exhibits a low vapor pressure and enhanced chemical and electrical stability at elevated temperatures, and is characterized by a high breakdown voltage and long life electrical stability.

3,609,468

PASTE COMPOSITION FOR AN ELECTROLYTIC CONDENSER AND ELECTROLYTIC CONDENSER CONTAINING SAME

Yasukane Kihara, Tokyo; Ushimatsu Moriyama, Fujisawa-shi, and Yoichi Seta, Yokohama-shi, all of Japan, assignors to Tokyo Shibaure Electric Co., Ltd., Kawasaki-shi, Japan

Filed Feb. 3, 1969, Ser. No. 796,075
Claims priority, application Japan, Feb. 5, 1968, 43/6715
Int. Cl. H01g *9/02*
U.S. Cl. 317—230 **2 Claims**

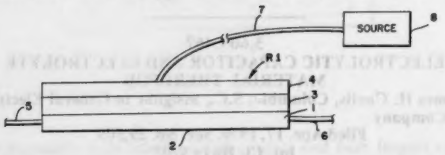
A paste composition for an electrolytic condenser consisting of electrolyte compounds, ethylene glycol and polyvinyl pyrrolidone. When used as an electrolyte for an electrolytic condenser, the composition furnishes the condenser with good withstand voltage properties and stable electrical properties.

3,609,469

VOLTAGE-CONTROLLED IONIC VARIABLE RESISTOR EMPLOYING MATERIAL TRANSFER

Charles Feldman, 7400 Rebecca Drive, Alexandria, Va.

Filed Dec. 22, 1967, Ser. No. 692,738
Int. Cl. H01g *9/14*
U.S. Cl. 317—231 **16 Claims**



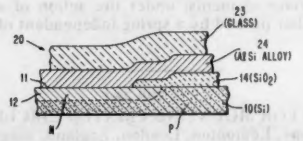
An ionic variable resistor comprises a base metallic film, an intermediate film of a solid ionic conductor containing a cation similar to the metal comprising the base layer, and an upper film layer of the same metallic material as the base layer. A source of potential connected across the device causes transference of material from the upper layer to the lower layer, or vice versa, depending on the polarity, to effect a change in resistance in the metal films. The variable resistor may be advantageously applied by vacuum deposition to microelectronic wafers, thin film substrates, or circuit boards.

3,609,470

SEMICONDUCTOR DEVICES WITH LINES AND ELECTRODES WHICH CONTAIN 2 TO 3 PERCENT SILICON WITH THE REMAINDER ALUMINUM

Lubertus L. Kuiper, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 474,074, July 22, 1965, Patent No. 3,382,568.
Filed Feb. 19, 1968, Ser. No. 739,992
Int. Cl. H01l *5/02*
U.S. Cl. 317—234 R **1 Claim**



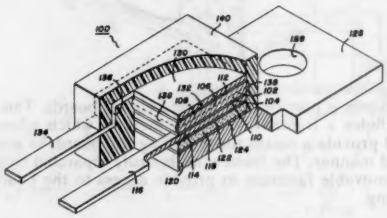
This is a semiconductor device provided with an electrode which contains a small percentage of the semiconductor material with the remainder of the electrode being metal.

3,609,471

SEMICONDUCTOR DEVICE WITH THERMALLY CONDUCTIVE DIELECTRIC BARRIER

Robert I. Scace, Skaneateles, and Glen A. Slack, Scotia, both of N.Y., assignors to General Electric Company

Filed July 22, 1969, Ser. No. 843,533
Int. Cl. H01l *1/12*
U.S. Cl. 317—234 R **7 Claims**



A semiconductor device is provided having a metallic heat sink to receive heat generated by internal power losses. Interposed between the semiconductive crystal in which the heat is generated and the heat sink is a thermally conductive dielectric barrier comprised of a unitary layer consisting essentially of aluminum nitride. The aluminum nitride may be in the form of a single crystal or may be polycrystalline. A stress-absorbing soft solder may be located adjacent a surface of the dielectric barrier.

3,609,472

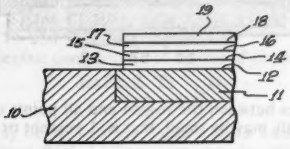
HIGH-TEMPERATURE SEMICONDUCTOR AND METHOD OF FABRICATION

Robert F. Bailey, Los Alamitos, Calif., assignor to TRW Semiconductors, Inc., Lawdale, Calif.

Filed May 21, 1969, Ser. No. 826,543
Int. Cl. H01l *3/00*
U.S. Cl. 317—234 R **13 Claims**

A contact for a semiconductor device capable of withstanding environments comprising high-temperature

treatment, chemical attack by silicon etchants, and high oxidation ambients, and a method of fabricating said contact. A bimetallic layer comprising an alloy of platinum and nickel is disposed upon the active regions of a semiconductor device,



the metal layer being in electrical contact with the semiconductor device. A layer of platinum is provided atop the platinum-nickel layer and this in turn is protected by a covering layer of rhodium. A layer of gold is then placed upon the rhodium for external connection.

3,609,473

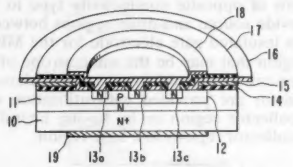
TWO-LAYER METALLIZED HIGH FREQUENCY TRANSISTOR EMPLOYING EXTENDED CONTACTS TO SHIELD INPUT TERMINAL FROM OUTPUT TERMINAL AND MOUNTED IN A COAXIAL CABLE

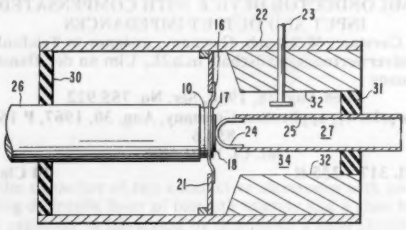
Charles A. Bittmann, Los Altos, and Gary W. Parker, Los Gatos, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mt. View, Calif.

Filed Sept. 2, 1969, Ser. No. 854,422

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **1 Claim**





The base and emitter contacts to a high frequency transistor are formed of two separate layers of metallization separated by an intervening dielectric. Either the base or the emitter lead is formed into a circular beam diaphragm, portions of which extend beyond the semiconductor chip. This circular lead mates around its external edge with an internal diaphragm in a coaxial package to form either the base or emitter connection to the transistor.

3,609,474

SEMICONDUCTOR WITH IMPROVED HEAT DISSIPATION CHARACTERISTICS

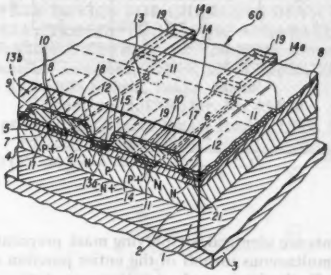
Britton T. Vincent, Jr., Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of application Ser. No. 649,320, June 27, 1967, now abandoned. This application Nov. 10, 1969, Ser. No. 871,602

Int. Cl. H01p *5/00*

U.S. Cl. 317—235 R **11 Claims**

Disclosed is a semiconductor device, such as a transistor, including an extended emitter contact with one portion thereof having a small dimension for contact to the emitter region of the device, and another relatively large heat dissipation portion overlying the base region of the transistor for



heat sinking purposes. The emitter contact is separated from the base contact by a relatively thick layer of insulation which avoids degrading the electrical parameters of the device.

3,609,475

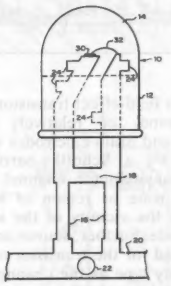
LIGHT-EMITTING DIODE PACKAGE WITH DUAL-COLORED PLASTIC ENCAPSULATION

George N. Kaposhilin, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 4, 1970, Ser. No. 34,078

Int. Cl. H01l *1/00*

U.S. Cl. 317—234 R **4 Claims**



A light-emitting diode (LED) is bonded to a pair of metal leads which are attached to a metal lead frame with a plurality of lead pairs, such that its optical axis is parallel to the longitudinal axis of the leads. The device so formed is encapsulated in two colors of plastic, a clear portion over the diode to transmit light from the diode and a dark portion behind the diode to improve the diode on-off contrast and make a hermetic seal with the leads. After encapsulation individual devices are separated from each other by cutting the leads from the lead frame.

3,609,476

INTERDIGITATED STRUCTURES FOR GATE TURNOFF THYRISTORS AND FOR TRANSISTORS

Herbert F. Storm, Delmar, N.Y., assignor to General Electric Company

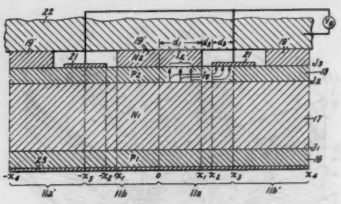
Filed June 26, 1970, Ser. No. 50,228

Int. Cl. H01l *5/00, 11/00*

U.S. Cl. 317—235 R **15 Claims**

An interdigitated emitter-base (or emitter-gate) layer structure is formed in the shape of an involute on a circular

wafer. Because of greater wafer utilization, higher power ratings in semiconductor devices are realized. The contours of the involute-shaped interdigitated emitter and base con-



tact elements are identical, simplifying mask preparation, and assuring simultaneous turnoff of the entire junction area in a gate turnoff thyristor, and simultaneous turn on in a transistor.

3,609,477

SCHOTTKY-BARRIER FIELD-EFFECT TRANSISTOR

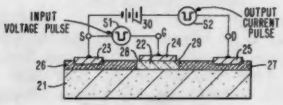
Karsten E. Drangeid, Hedingen; Theodor O. Mohr, Gattikon, Switzerland; Horst F. Statz, Peekskill, N.Y., and Waldemar Von Muench, Aachen, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 11, 1968, Ser. No. 720,648

Claims priority, application Switzerland, Apr. 18, 1967, 5508/67

Int. Cl. H01o *11/14*

U.S. Cl. 317—235 R **3 Claims**



A Schottky-barrier field-effect transistor is disclosed with a semiconductor channel of relatively low conductivity between the source and drain electrodes which may be electrically influenced by a Schottky-barrier gate electrode located on the semiconductor channel. The transistor is characterized by a zone or region of higher conductivity which extends from the vicinity of the source electrode to near the gate electrode. Further, source and drain regions are conveniently provided for the transistor of semiconductor of the same conductivity type as the channel semiconductor at the Schottky-barrier electrode. Advantageously, the drain region may be made of semiconductor of high conductivity and the same conductivity type as the source region. The high conductivity region may be achieved through either diffusion or epitaxial growth technique.

3,609,478

BURIED-LAYER SEMICONDUCTOR DEVICE FOR DETECTING AND MEASURING THE ENERGY AND ATOMIC NUMBER OF IMPINGING ATOMIC PARTICLES

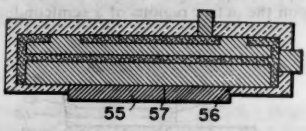
William J. King, Reading, Mass., and Frederick W. Martin, Brabrand, Denmark, assignors to Ion Physics Corporation, Burlington, Mass.

Filed Oct. 16, 1967, Ser. No. 675,688

Int. Cl. H01l *11/00*

U.S. Cl. 317—235 **1 Claim**

The present invention relates to radiation detection devices and more particularly to a solid-state device capable of detecting and measuring the energy and atomic number of impinging particles. This device contains a region imbedded completely within its body which is opposite conductivity type than the body and which is separated from the body by two distinct PN junctions. The imbedded region is produced by ion implantation and differs from such regions produced by other means in that the percentage compensation of do-



pant impurities between the region and all points on the surface of the body may be small, that is, 1 percent or less.

3,609,479

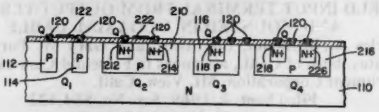
SEMICONDUCTOR INTEGRATED CIRCUIT HAVING MIS AND BIPOLAR TRANSISTOR ELEMENTS

Hung Chang Lin, Silver Spring, and Karl Ka-Chung Yu, Laurel, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 29, 1968, Ser. No. 709,344

Int. Cl. H01l *11/14*

U.S. Cl. 317—235 **1 Claim**



MIS and bipolar transistor elements are provided within a unitary body of semiconductor material wherein first and second regions of opposite conductivity type to that of the substrate provide source and drain regions between which is positioned an insulated gate electrode for the MIS transistor while in a region that may be the same as one of the source and drain regions or an additional region, elements of the bipolar transistor are provided with utilization of the substrate as a collector region or by having lateraliy disposed emitter and collector regions in a base region.

3,609,480

SEMICONDUCTOR DEVICE WITH COMPENSATED INPUT AND OUTPUT IMPEDANCES

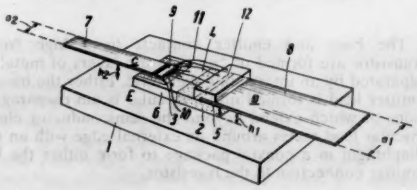
Dieter Gerstner, Willsbach, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm an der Danube, Germany

Filed Aug. 28, 1968, Ser. No. 755,922

Claims priority, application Germany, Aug. 30, 1967, P 16 14 858.6

Int. Cl. H01l *5/00*

U.S. Cl. 317—235 R **14 Claims**



A four-terminal semiconductor device, i.e., a device with two input and two output electrodes, having a semiconductor element, a metallic baseplate which is connected to the semiconductor element and constitutes one of the input and one of the output electrodes, and at least two strip-shaped electrodes which are insulated from the baseplate, extend in opposite directions parallel to the baseplate, and are electrically connected to the semiconductor element. The strip-shaped electrodes have different widths and/or are spaced different distances from the metalic plate so as to provide broadband compensation for the input and output inductances and/or capacitances of the device.

3,609,481
IRON SUBSTITUTED BARIUM TITANATE FERROELECTRIC COMPOSITIONS AND CAPACITORS COMPRISING SAME

Lothar H. Brixner, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 29, 1968, Ser. No. 724,899
Int. Cl. H01g 3/06; C04b 35/00
U.S. Cl. 317—238 2 Claims

A ferroelectric composition of matter of the formula

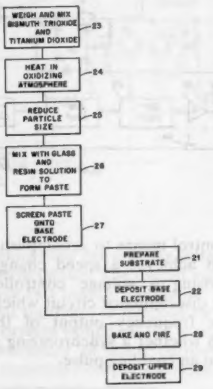
$$Ba\underset{\frac{x}{2}}{Fe_xZ}\ \underset{1-\frac{3x}{2}}{Ti}\ O_3$$

where Z may be W^{+6} or Mo^{+6} and x has a value from about 0.001 to about 0.03, having a tetragonally distorted perovskite crystal structure.

3,609,482
BISMUTH TITANATE FILM CAPACITOR AND METHOD OF MANUFACTURE

Frank H. Edelman, Wellesley, and Simon Ernest Mayer, Lexington, both of Mass., assignors to Sylvania Electric Products Inc.

Filed Jan. 28, 1970, Ser. No. 6,439
Int. Cl. H01g 3/135; C04b 35/46
U.S. Cl. 317—258 11 Claims



Film capacitor of two conductive electrodes with an intervening dielectric layer of bismuth titanate and a glass binder. The capacitor is fabricated by depositing a base electrode of a gold-palladium alloy on an alumina substrate. A dielectric paste of a mixture of bismuth titanate, a lead-boro-silicate glass, and a resin solution is silk screened onto the base electrode, and then baked and fired. An upper electrode of silver is deposited on the bismuth titanate.

3,609,483
THICK FILM TITANATE CAPACITOR COMPOSITION

James P. Smyly, Laurens, Tenn., assignor to American Lava Corporation, Chattanooga, Tenn.

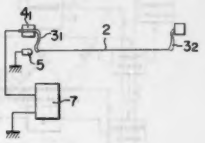
Filed July 1, 1969, Ser. No. 838,308
Int. Cl. H01g 1/01; C04b 33/00
U.S. Cl. 317—258 4 Claims

An improved dielectric composition for thick film capacitors and paste for making the same are provided. The composition is a mixture of a high dielectric constant material, a glass frit and modifying oxides and/or compounds blended and milled together and dispersed in a suitable vehicle. The resulting paste can be spread to give a thick film capacitor dielectric which has a dielectric constant up to 1,000. The capacitance per square inch may be in excess of 50,000 pf. per inch^2 (7,500 picofarads per square centimeter). The composition adheres well to electrodes of usually desirable metals such as gold, silver, palladium and other noble metals and has maturing temperatures consistent with the use of such metals.

3,609,484
SAFETY DEVICE FOR CHARGING DEVICE OF ELECTROPHOTOGRAPHIC APPARATUS

Hisashi Sakamaki, Kawasaki-shi; Yoshimasa Kimura, Tokyo, and Osamu Sawamura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 5, 1970, Ser. No. 43,820
Claims priority, application Japan, June 9, 1969, 44/53157
Int. Cl. G03g 15/02
U.S. Cl. 317—262 A 4 Claims

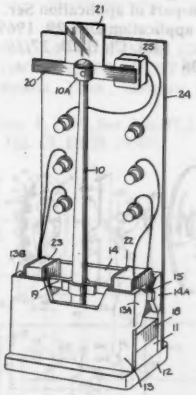


A charging device for use in electrophotographic apparatus has at least one corona discharge wire which is suspended on a wire retaining member. When the corona discharge wire is broken, one end of the wire retaining member is brought into contact with a short circuit electrode provided on a frame body to form a closed current loop to the ground.

3,609,485
RESONANT TORSIONAL OSCILLATORS

Frank Dostal, Elmhurst, N.Y., assignor to Bulova Watch Company, Inc., New York, N.Y.

Filed Apr. 9, 1969, Ser. No. 814,649
Int. Cl. H02k 33/12
U.S. Cl. 318—132 6 Claims



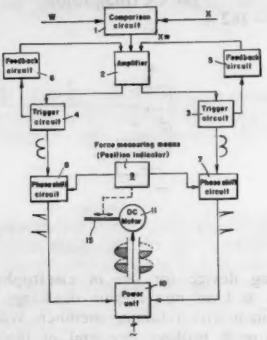
A resonant torsional oscillator adapted to serve as an optical chopper or to provide other useful functions which require a vibratory action at a high amplitude and a constant rate. The oscillator is constituted by an erect torsional rod whose base is anchored, an optical element being attached to the free end of the rod. The rod is sustained in torsional vibration by means of an electromagnetically driven armature secured to the rod, the point of attachment being adjacent the base whereby the torsional swing at the free end of the rod is amplified with respect to that at said point.

3,609,486

METHOD AND APPARATUS FOR MOVEMENT OF MECHANICAL MEMBERS BY AN ELECTRIC MOTOR

Heinrich Feldhoff, Bad Duerkheim; Georg Schlereth, Limburgerhof, Pfalz, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Land Rheinland, Pfalz, Germany

Filed Oct. 13, 1969, Ser. No. 865,940
Claims priority, application Germany, July 22, 1965, P 14 38 974.3
Int. Cl. G05b *11/28*
U.S. Cl. 318—138 **6 Claims**



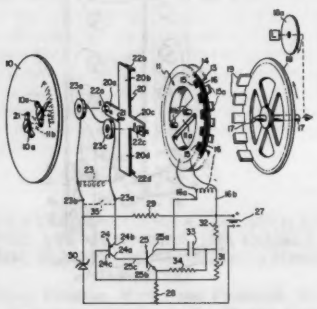
Method and apparatus for control of DC motor directly connected to actuating element of control or regulating device with step actuation of motor by pulse modulation in trains of individual pulses whose energy content is varied in dependence on the force requirement to move the mechanical member.

3,609,487

DC MOTOR AND CONSTANT-SPEED CONTROL CIRCUIT

William W. Allison, Melville, N.Y., assignor to Armec Corporation, Huntington Station, N.Y.

Continuation-in-part of application Ser. No. 721,965, Apr. 17, 1968. This application Oct. 29, 1969, Ser. No. 870,577
Int. Cl. H02k *27/20*
U.S. Cl. 318—138 **13 Claims**



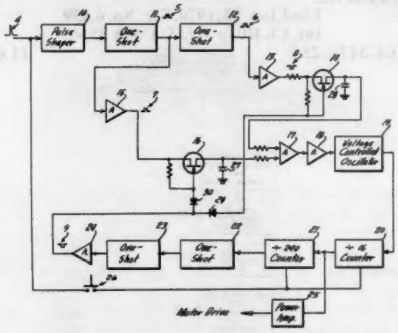
In accordance with a preferred embodiment of the invention, a DC motor is both driven and controlled through a common winding by providing a circuit which includes both power and control portions and is preferably self-oscillatory in the absence of rotor motion and at a frequency related to desired rotor speed to define, in conjunction with rotor-generated signals, limits of motor speed. The power portion includes an electronic switch and motor current limiter and the control portion includes an amplifier stage to operate the switch and two separate feedback paths are provided from the power portion to the amplifier stage. A mechanical resonator is coupled to the rotor to be excited into resonance as the motor reaches synchronous speed, and an electromagnetic pickup from the resonator feeds a signal into the amplifier stage to furnish a dominating control signal, thus synchronizing the motor to the resonator to achieve precise motor speed while enabling the motor to be either self-starting or, if desired, capable of starting with a very slight push, and to recover synchronous speed following disturbance to rotor speed for any reason including loss of power.

3,609,488

SPEED CONTROL FOR A SYNCHRONOUS MOTOR

John B. Sampson, Cupertino, and Hadyn L. Smith, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Mar. 9, 1970, Ser. No. 17,676
Int. Cl. H02p *7/42*
U.S. Cl. 318—171 **5 Claims**



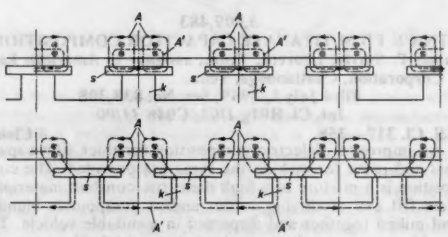
A motor control means to accomplish frequency changing which in turn achieves a speed change in a synchronous motor comprising a voltage controlled oscillator which responds to a discriminator circuit which either increases or decreases the frequency output of the oscillator in accordance with whether a synchronizing pulse is early or late with respect to an enabling pulse.

3,609,489

ARRANGEMENT FOR REDUCING POLE CORE CURRENTS IN SYNCHRONOUS MOTORS WITH SALIENT POLES

Kurt Baltisberger, Birr, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Nov. 24, 1969, Ser. No. 879,243
Claims priority, application Switzerland, Nov. 28, 1968, 17711/68
Int. Cl. H02p *1/48*
U.S. Cl. 318—173 **1 Claim**



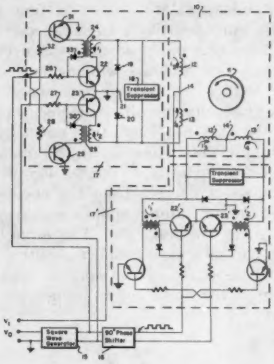
A synchronous motor is provided with a rotor of the salient pole type with a permanent connection for operation with an

N number of poles but the stator winding is provided with a pole switching arrangement in order to reduce the pole core currents during a starting-up operation of the motor. During the initial phase of the start from standstill to about half, i.e. synchronous speed, the stator winding is connected in such manner as would correspond to a 2N-pole arrangement on the rotor. When the half normal speed is reached, the stator winding is then reconnected to correspond to the actual N-pole arrangement on the rotor.

3,609,490
TWO PHASE MOTOR DRIVE CIRCUIT

Leroy R. Keranen, Lawndale, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 16, 1970, Ser. No. 19,910
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **9 Claims**

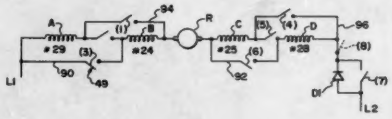


A circuit for providing base drive to the output stages of a square wave motor drive circuit. The output stage of a motor drive circuit comprises two output transistors. The collector current of each output transistor is sampled by the primaries of two current transformers wound on the same core for DC cancellation. The secondary of each current transformer drives the base of its respective output transistor.

3,609,491
SELECTABLE MODE MULTIPUSHBUTTON SWITCH

Roy L. Swanke, Newington, and Bruno M. Valbona, Avon, both of Conn., assignors to Dynamics Corporation of America, New York, N.Y.

Filed Dec. 2, 1969, Ser. No. 881,395
Int. Cl. H02p *7/10*
U.S. Cl. 318—252 **15 Claims**

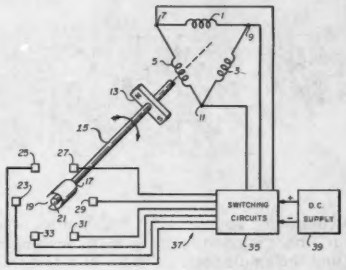


A motor-driven appliance including a multipushbutton switch with permutatable control sliders and switches providing different speeds selectively in association with a mode control to provide either a continuous or a momentary run of the appliance when any of the speed selection pushbuttons is manually pressed. The mode control in one position returns the sliders to "OFF" position when a pushbutton is released that was being pressed, while in another position the sliders remain in a continuous run position when the pressed pushbutton is released. The mode is selected by varying the tension upon a spring which urges the return of sliders and pushbuttons to a predetermined position. The mode can be changed during operation of the liquidizer and can serve as a stop control.

3,609,492
REVERSIBLE BRUSHLESS DC MOTOR

Rodney G. Rakes, Bristol, Tenn., assignor to Sperry Rand Corporation

Filed July 17, 1970, Ser. No. 55,793
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 **3 Claims**

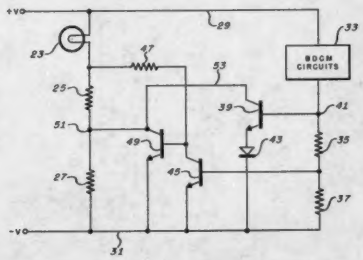


An optically commutated brushless DC motor contains a multijunction closed-loop stator winding. Each junction is energized through separate switching circuits in response to illumination of a corresponding photocell. Each photocell may be coupled to either one of two switching circuits through a gate in one or the other of two groups of gates. A directional control circuit disables both groups of gates in the absence of a command signal but enables one or the other group of gates in response to a clockwise or counterclockwise command signal, respectively. The directional control circuit further contains feedback means that prevents the circuit from responding to a reverse command signal until the termination of a previously applied command signal.

3,609,493
OPTICALLY COMMUTATED BRUSHLESS DC MOTOR HAVING CONTROLLED LIGHT SOURCE

Rodney G. Rakes, Bristol, Tenn., assignor to Sperry Rand Corporation

Filed Nov. 5, 1970, Ser. No. 87,212
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 **6 Claims**



An optically commutated brushless DC motor includes a voltage divider in series with the commutator light source and a tapped resistor in series with the stator windings of the motor. The resistor provides a voltage drop proportional to the motor drive current. Transistor circuits are actuated in response to the voltages appearing across the resistor and arranged to provide a shunt path around a portion of the volt-

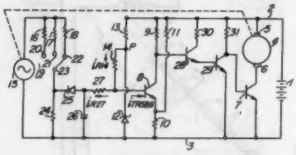
age divider when the motor current becomes either abnormally high or low. With a portion of the voltage divider thus shunted, the output of the light source is intensified. The increased intensity prevents underlap so as to provide extra drive during starting or stall conditions.

3,609,494

SPEED-CONTROLLING APPARATUS FOR DC MOTOR

Tadashi Takahashi, and Kazuo Onishi, both of Hitachi-shi, Japan, assignors to Hitachi Ltd., Tokyo, Japan

Filed Nov. 14, 1968, Ser. No. 775,806
Claims priority, application Japan, Nov. 17, 1967, 73650/67
Int. Cl. H02p 5/16
U.S. Cl. 318—328 **12 Claims**



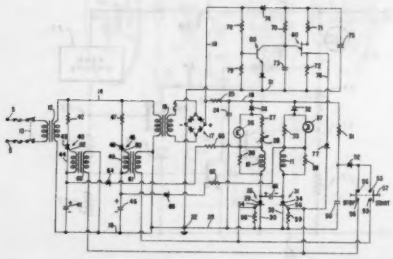
A speed-controlling apparatus for DC motors, wherein a closed series circuit is constituted by a DC power source, a DC motor and the emitter and collector of a first transistor, whereby the conductivity between the emitter and the collector of the transistor is controlled to thereby achieve constant speed control with respect to the DC motor. Further, a biasing circuit for supplying a constant base current to a second transistor is formed by a Zener diode and a resistor. The output of an AC generator which is mechanically conducted with said DC motor is rectified by means of a diode. The output circuit of the AC generator is combined with said biasing circuit in such polarity that the current of said biasing circuit is positively shunted by the rectified output current, so that the conductivity between the emitter and the collector of the first transistor is controlled in accordance with variation in the collector potential of the second transistor, thereby maintaining the speed of the DC motor constant.

3,609,495

CONTROL CIRCUITS FOR ELECTROMAGNETIC CLUTCH-BRAKE DRIVING DEVICES

Henry A. Seesselberg, South Plainfield, N.J., assignor to The Singer Company, New York, N.Y.

Division of Ser. No. 737,543, June 17, 1968, Patent No. 3,516,526.
Filed Dec. 5, 1969, Ser. No. 882,803
Int. Cl. H02p 3/04, 3/06
U.S. Cl. 318—368 **3 Claims**



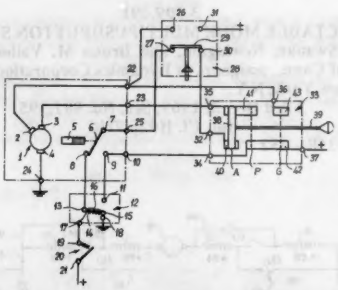
A circuit which does not require mechanical relays is disclosed using silicon-controlled rectifiers (SCR's) for controlling manually and/or automatically the starting and stopping of a clutch-brake motor having an electromagnetically actuated clutch and brake. Each clutch turnoff brake winding is connected to a source of full wave rectified AC voltage through its own SCR and selective turnoff is effected by capacitor commutation. Momentary overexcitation of both windings is provided by alternative initial discharge therethrough of energy previously stored in respective capacitors. These capacitors are charged through separate individual SCR's from an AC voltage of a value higher than the normal DC energizing voltage used for continuously exciting the coils. The four SCR's are turned on in pairs, one SCR of each pair closes a circuit connecting the respective winding to the previously charged capacitor and thereafter to the normal DC energizing bus. Diode gates prevent adverse interaction between the capacitors and the DC bus and provide properly timed energy flow from the DC bus to the winding as soon as the capacitor voltage drops to a value slightly below the bus voltage so that there is no discontinuity in the winding excitation. The trigger pulse which turns on one SCR to energize one winding also turns on the other SCR of the pair, which latter SCR connects the capacitor for charging or storing energy which is later released for initially energizing the other winding. A no-voltage release circuit employs a unijunction transistor (UJT) as a relaxation oscillator connected to a DC supply having a large capacitor. This oscillator provides triggering pulses to the gate of the SCR which controls excitation of the brake winding. Normally, however, with full line voltage, a transistor base-biased to saturation, has its emitter-collector circuit connected across the timing capacitor of the UJT oscillator, thus normally shorting the capacitor and preventing oscillation. Upon failure of line voltage, the transistor turns off due to loss of base bias and the timing capacitor charges from the energy in the large capacitor, and the oscillator supplies a triggering pulse to the SCR for energizing the brake coil. The voltage of the previously charged capacitor now connected to the brake winding will, even in the absence of line voltage, supply a high impulse of energy to the brake coil to bring the load quickly to standstill.

3,609,496

WINDSCREEN WIPER CONTROL SYSTEMS

Francois Peroy, and Jean Pineau, both of Billancourt, France, assignors to Regie Nationale Des Usines Renault, Billancourt, France and Automobiles Peugeot, Paris, France

Filed Sept. 9, 1968, Ser. No. 758,380
Claims priority, application France, Sept. 18, 1967, 121,375
Int. Cl. H02p 1/04
U.S. Cl. 318—444 **3 Claims**



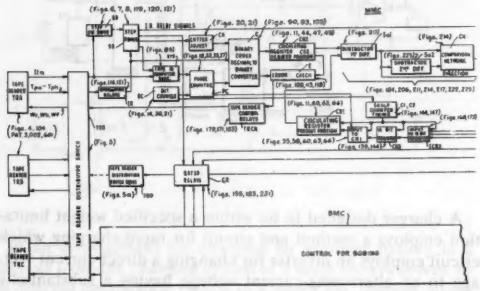
The improvement is characterized by the combination of the windscreen wiper driving motor with a reversing switch responsive to the windscreen washer pump control means, with a timelag device and with a reversing switch responsive to a fixed-stop control cam, whereby a single maneuver of a single member is sufficient for causing the motor to operate as consistent with the momentary atmospheric circumstances, an additional maneuver of said pump control means permitting modifying said motor operation, if necessary.

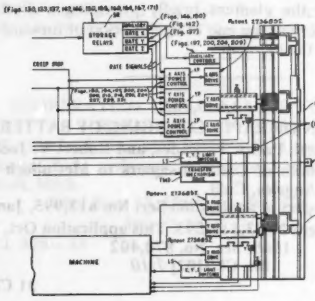
3,609,497

NUMERICAL CONTROL INCLUDING ZERO OFFSET AND PULSE COUNTING DIGITAL COMPARISON

Tom T. Kumagai, Gardena; William C. Leone, Palos Verdes Estate; Michael May, Los Angeles; Harold A. Shoemaker, Santa Monica, and Roy A. Howard, Manhattan Beach, all of Calif., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Division of Ser. No. 827,981, Mar. 10, 1959, Patent No. 3,245,144.
Filed Jan. 12, 1966, Ser. No. 598,525
Int. Cl. G05b *19/28*
U.S. Cl. 318—610 7 Claims





A numerically controlled positioning system for positioning a movable member, employing serial signal processing circuits having circulating registers for receiving discrete input signals representative of a desired position of the member and for receiving feedback signals of actual position of said member, in which, arithmetic combinations of the input signals, compensated as required for position offset, and the feedback signals, provide control signals for positioning the member.

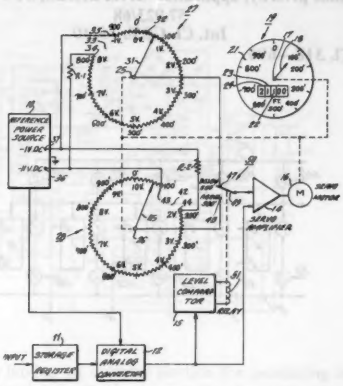
3,609,498

CONVERTER FOR POSITIONING A CONTINUOUSLY ROTATABLE SHAFT UTILIZING CYCLIC DIGITAL INFORMATION

John H. Andresen, Jr., Hewitt, N.J., and James A. Fitzpatrick, Bayside, N.Y., assignors to Intercontinental Dynamics Corporation, Englewood, N.J.

Filed Dec. 5, 1969, Ser. No. 882,684
Int. Cl. G05b *1/06*
U.S. Cl. 318—665 7 Claims

A servomechanism for converting cyclic digital information to a continuously rotating shaft position is controlled by an error signal derived by comparing the voltage analog of the cyclic digital information and the voltage obtained from a selected one of two potentiometers, both of which have wiper arms which rotate in unison with the continuously rotating shaft. A level comparator controlled by signals from the converter which changes the digital information to an analog signal is used to select which potentiometer is connected to the servoamplifier.

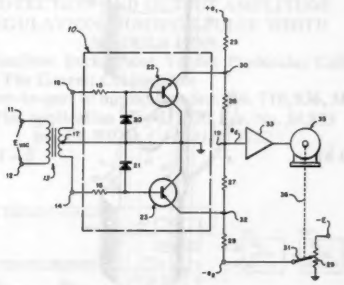


3,609,499

ELECTRONIC CHOPPER CIRCUIT

Ronald C. Scheerer, Baltimore, and Roger L. Woods, Glen Burnie, both of Md.

Filed Apr. 29, 1970, Ser. No. 33,025
Int. Cl. G05b *11/12*
U.S. Cl. 318—684 9 Claims



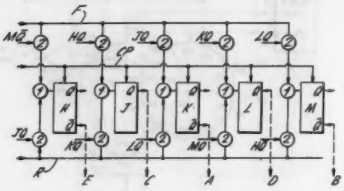
A servo system utilizing an electronic chopper for producing shaft rotation indicative of the amplitude of a DC input signal. The DC signal is converted to square wave form by shunting the signal through a complementary pair of transistors to ground. A constant AC signal applied to the input bases of the transistors determines the frequency of the shunting action which in turn determines the frequency of the square wave. The square wave signal is amplified and applied to a servo motor for driving a potentiometer indicator in accordance with the amplitude of the DC input signal.

3,609,500

STEPPING MOTOR HAVING AN ODD NUMBER OF WINDINGS, THE WINDINGS BEING ENERGIZED AT ALL TIMES

Roy Causer, Wantage, and Eric Ronald Rein, Newbury, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 5, 1969, Ser. No. 882,433
Claims priority, application Great Britain, Dec. 5, 1968, 57.923/68
Int. Cl. G05b 19/40
U.S. Cl. 318—696 4 Claims



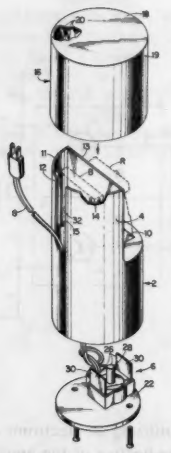
The stepping motor is wound with five star-connected field windings. Drive for five-phase operation is generated with logic circuitry having provision for forward and reverse. Increased torque as compared with a conventional three-phase system, and equal torque per step are achieved.

3,609,501

HOLDER FOR APPLIANCE AND ASSOCIATED ARTICLES

Bruce F. Ray, Danvers, and Richard J. Petrillo, Norwell, both of Mass., assignors to The Gillette Company, Boston, Mass.

Filed Jan. 19, 1970, Ser. No. 3,615
Int. Cl. H02j 7/00
U.S. Cl. 320—2 9 Claims



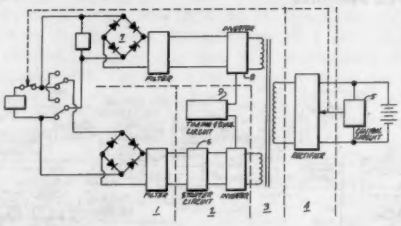
Holder for electrical appliance and associated articles, the holder including a base portion housing a battery-charging means and having a recess for receiving an appliance, and a hollowback portion extending from the base position and having runner means for slidingly receiving articles associated with the appliance.

3,609,502

HIGH FREQUENCY BATTERY CHARGER EMPLOYING AN INVERTER

Wilford B. Burkett, Pacific Palisades, and John H. Bigbee, III, Los Angeles, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Filed July 24, 1969, Ser. No. 844,469
Int. Cl. H02j 7/10
U.S. Cl. 320—5 20 Claims



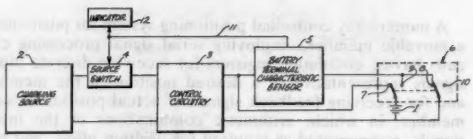
A charger designed to be within a specified weight limitation employs a method and circuit for rapid-charging which circuit employs an inverter for changing a direct current voltage to an alternating-current voltage having a substantially square wave form and a relatively high frequency in the order of 10,000 Hertz, and a rectifying circuit connected to the output of the inverter, for changing the high frequency alternating-current voltage to direct-current voltage for application to the battery to be charged. At least one unilateral impedance element is in the current path through the rectifying circuit with the element briefly providing a discharge path for the battery at the end of each period of forward conduction through the element.

3,609,503

TERMINATION OF RAPID CHARGING OF BATTERIES

Wilford B. Burkett, Pacific Palisades, and Robert V. Jackson, Los Angeles, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Continuation-in-part of application Ser. No. 612,995, Jan. 31, 1967, now Patent No. 3,517,293. This application Oct. 20, 1969, Ser. No. 870,402
Int. Cl. H02j 7/10
U.S. Cl. 320—5 31 Claims



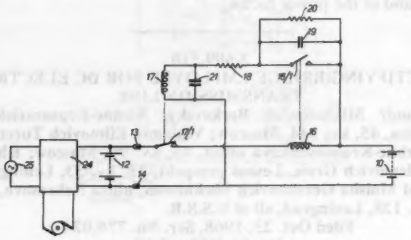
A battery is charged rapidly by alternately applying a charging current to the battery and selectively discharging the battery. During this rapid charging operation, the magnitude of charge on the battery is determined by monitoring terminal characteristics of the battery. When the monitored terminal characteristic of the battery reaches a predetermined value, the rapid charging operation is either manually or automatically terminated. Such terminal characteristics as average discharge current, energy release during a discharge interval, terminal voltage of the battery an increment of time after the start of the discharge interval, and the frequency of the discharge interval are monitored.

3,609,504

APPARATUS FOR DISCONNECTING AN AUXILIARY BATTERY FROM A MAIN BATTERY DURING DISCHARGE OF THE MAIN BATTERY

John S. N. Barker, and Ronald H. Minter, both of Northam, England, assignors to Bardic Systems Limited, Northam, Southampton, England

Filed Oct. 29, 1969, Ser. No. 872,018
Claims priority, application Great Britain, Oct. 31, 1968, 51,758/68
Int. Cl. H02j 7/00
U.S. Cl. 320—7 3 Claims



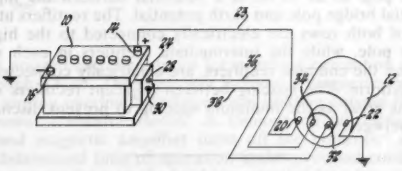
In an arrangement for charging an auxiliary battery in a caravan from the charging system of a main battery driven by an internal combustion engine in a motor car, without allowing it to be discharged by the self-starter, the two batteries are connected in parallel through an overcurrent relay which disconnects the auxiliary battery if its discharge current exceeds a predetermined value. The batteries are reconnected after a period by a delayed resetting means, so that if the starter is still taking a heavy current the relay will alternately close for a short period and open for a much longer period thereby preventing discharge of the auxiliary battery.

3,609,505

TEMPERATURE COMPENSATED VOLTAGE REGULATION SYSTEM

Glen E. Harland, Jr., and Richard E. Lavengood, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1969, Ser. No. 876,266
Int. Cl. H02j 7/14
U.S. Cl. 320—35 2 Claims



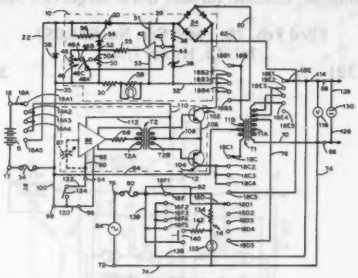
A battery charging system includes a voltage regulator having a drive section and an output section. The drive section contains all of the temperature sensitive drive components of the voltage regulator. The power section contains all of the heat-producing power components of the voltage regulator. The drive section is mounted on the battery in intimate heat-conducting relationship so that the temperature sensitive drive components are compensated for variations in the temperature of the battery. The power section is mounted on the generator out of intimate heat-conducting relationship with the drive section so that the temperature sensitive drive components are not effected by the heat-producing power components.

3,609,506

BATTERY APPARATUS

James A. Frezzolini, and James J. Crawford, both of Ringwood, N.J., assignors to Frezzolini Electronics Inc., Hawthorne, N.J.

Filed Jan. 21, 1969, Ser. No. 792,318
Int. Cl. H02j 7/04
U.S. Cl. 320—39 22 Claims



Apparatus having an inverter portion for producing an alternating potential from a battery and a charger portion for charging the battery including a pair of input terminals adapted to be connected to a battery. The charger portion includes a pulse generator, a switching device for connecting the pulse generator with the input terminals in response to a control signal, voltage reference means, and regulating means for producing the control signal in response to the difference between the battery terminal voltage and the voltage reference means. The inverter portion includes an oscillator for producing an alternating signal of preselected frequency at a pair of output terminals. Switching means is provided to selectively connect the input terminals with the charger portion or the inverter portion to provide a compact and versatile device which may be used as an inverter and, after the battery has been discharged, as a charger to charge the same.

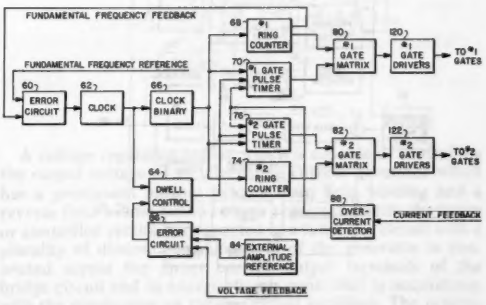
The apparatus further includes simple frequency test means for testing the frequency of the inverter output signal.

3,609,507

POLYPHASE INVERTER SYSTEM HAVING FAULT PROTECTION AND OUTPUT AMPLITUDE REGULATION THROUGH PULSE WIDTH MODULATION

William Hamilton Beck, Palos Verdes Peninsula, Calif., assignor to The Garrett Corporation

Continuation-in-part of application Ser. No. 710,936, Mar. 6, 1968. This application May 5, 1970, Ser. No. 34,833
Int. Cl. H02m 1/12, 1/18, 7/52
U.S. Cl. 321—5 14 Claims

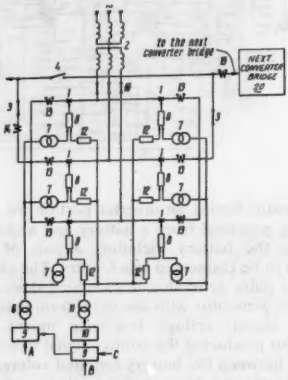


A power conditioning system which by pulse width modulation of a polyphase inverter bridge provides fault protection and output amplitude regulation.

3,609,508
CONTROLLED VALVE-TYPE CONVERTER

Kazimir Borisovich Gusakovsky, Grazhdansky prospekt, 51, kv. 25, Leningrad; Evgeny Mitrofanovich Semisalov, Kantemirovskaya ulitsa, 17, kv. 6, Leningrad; Vikenty Ivanovich Shiryaev, prospekt Engelsa, 40, kv. 26, Leningrad, U.S.S.R.; Boris Sergeevich Melik-Sarkisov, deceased, late of Leningrad, U.S.S.R. (Anna Matvenna Kirsanova, deceased, prospekt Engelsa, 40, kv. 3, Leningrad, U.S.S.R.), and Anna Matveena Kirsanova, prospekt Engelsa, 40, kv. 3, Leningrad, U.S.S.R. (of said Boris Sergeevich Melik-Sarkisov)

Filed Feb. 20, 1969, Ser. No. 801,053
Int. Cl. H02m *7/00*
U.S. Cl. 321—5 **3 Claims**

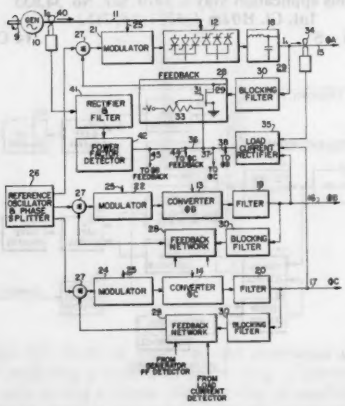


A controlled valve-type converter for substations of DC electric transmission lines with a plurality of series-connected three-phase valve-type bridges, wherein each of the devices adapted for short-time shunting of the bridge is so implemented that the operating valves of the bridge are made use of as shunting valves.

3,609,509
FEEDBACK CONTROL FOR CYCLOCONVERTER

David Logan Lafuze, Waynesboro, Va., assignor to General Electric Company

Filed Mar. 11, 1970, Ser. No. 18,539
Int. Cl. H02m *5/30*
U.S. Cl. 321—7 **19 Claims**

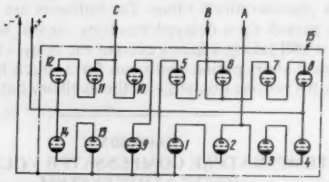


The invention relates to a circuit for reducing the magnitude of the feedback in a cycloconverter of the type incorporating a phase controlled rectifier system to provide protection both against high load current and the lagging low-power factor loads which are likely to cause miscommutation of the controlled rectifiers. In the inverting mode, the firing angle for the rectifiers is progressively retarded at high load currents and low-power factors and system perturbations are very likely. The feedback is reduced to protect the system against this eventuality. By sensing both the output current and the phase angle of the output load, the feedback is reduced if either load becomes excessive or if the power factor drops. The power factor and the load current are sensed to produce a pair of signals which are utilized to control an electrically variable resistance element in the feedback path to control the amount of feedback as a function both of the load and of the power factor.

3,609,510
RECTIFYING BRIDGE EMPLOYED FOR DC ELECTRIC TRANSMISSION LINE

Alexandr Mikhailovich Berkovsky, Nizhne-Krasnoselskaya ulitsa, 45, kv. 244, Moscow; Viniamin Efimovich Turetsky, Nizhne-Krasnoselskaya ulitsa, 45, kv. 90, Moscow; Khaim Shlemovich Grois, Lesnoi prospekt, 15, kv. 33, Leningrad, and Moisha Gershkovich Shekhtman, ulitsa Nekrasova, 60, kv. 128, Leningrad, all of U.S.S.R.

Filed Oct. 23, 1968, Ser. No. 770,024
Int. Cl. H02m *7/00*
U.S. Cl. 321—8 **2 Claims**



A rectifying bridge for a high voltage DC power transmission system comprises a plurality of rectifiers connected in two groups in each AC phase in a respective bridge arm thereof. A platform supports the rectifiers in two rows and the platform is electrically connected to the lower potential bridge pole so as to be at a potential between the higher potential bridge pole and earth potential. The rectifiers at the ends of both rows are electrically connected to the higher bridge pole, while the intermediate rectifiers in each row, between the endmost rectifiers, are electrically connected to the platform. The spacing between adjacent rectifiers is at least as great as the minimum spacing to prevent discharge therebetween.

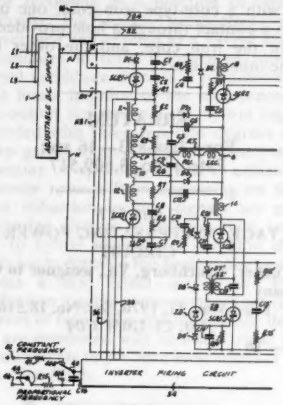
3,609,511
ELECTRONIC INVERTER HAVING PRECHARGING CONTROL AFFORDING HIGH FREQUENCY SWITCHING AT LOW OUTPUT

Robert L. Risberg, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 20, 1969, Ser. No. 867,740
Int. Cl. H02m *7/48*
U.S. Cl. 321—45 R **9 Claims**

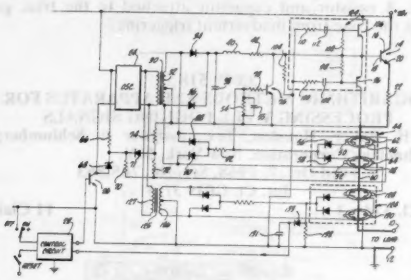
A single or plural phase solid state inverter having a half bridge for each phase and each half bridge including a pair of power semiconductor controlled rectifiers for switching, inductance-capacitance circuits for commutation of the power SCR's, a separate and electrically isolated precharging supply for each phase, and a pair of voltage level detectors of the solid state type that allow use of the commutating energy in one part of the half bridge for charging the commutating capacitor to the required voltage level in the other part of the

half bridge, above which the level detector becomes operative to allow feedback of the remaining energy to the supply,



thereby to afford relatively high frequency switching in the inverter at low output voltages in an efficient manner.

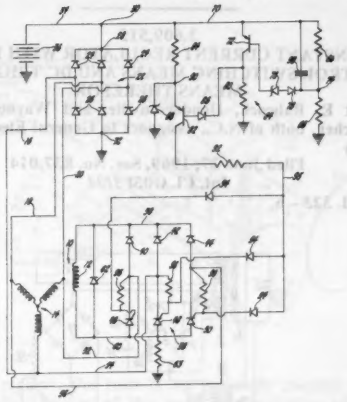
3,609,512
APPARATUS FOR CONTROLLING POWER TO A LOAD BY SENSING OVERLOAD CONDITIONS
Edward E. Lewis, Hillsborough, Calif., assignor to Leach Corporation, South Pasadena, Calif.
Filed Nov. 8, 1968, Ser. No. 774,250
Int. Cl. G05f *1/58*
U.S. Cl. 323—9 **16 Claims**



A power controller circuit for switching current on and off through a load. The controller includes a magnetic amplifier for sensing overload conditions and limiting current through a power transistor switch. A timeout circuit including a second magnetic amplifier turns off the controller after a predetermined time of operation under overload conditions. The current through the load is controlled by a bias winding on the magnetic amplifier controlled in response to the voltage across the load such that the average current under short circuit load conditions is substantially reduced over normal overload conditions.

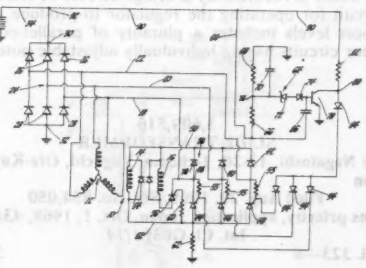
3,609,513
GENERATOR VOLTAGE REGULATOR WITH INITIAL EXCITATION MEANS
Louis J. Raver, Anderson, and Robert J. Nowakowski, Indianapolis, both of Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed July 2, 1970, Ser. No. 52,024
Int. Cl. H02p *9/08, 9/30*
U.S. Cl. 322—28 **4 Claims**

A voltage regulator for regulating the output voltage of a diode-rectified alternating current generator which is used to supply the electrical loads on a motor vehicle including charging the battery. The voltage regulator includes a field energizing bridge circuit comprised of controlled rectifiers and diodes having direct current output terminals connected with the field winding of the generator. The conduction of the controlled rectifiers is controlled by a voltage sensing cir-



cuit coupled with the gates of the controlled rectifiers and sensing the output voltage of a power bridge rectifier. A resistor is connected between one direct current output terminal of the field energizing bridge circuit and one side of the battery and this resistor provides part of a circuit for initially forward biasing the controlled rectifiers of the field energizing bridge by battery voltage.

3,609,514
GENERATOR VOLTAGE REGULATOR
Robert J. Nowakowski, Indianapolis; Robert W. Campbell, Anderson, and Ronald A. Martin, Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed July 27, 1970, Ser. No. 58,363
Int. Cl. H02p *9/30*
U.S. Cl. 322—28 **4 Claims**



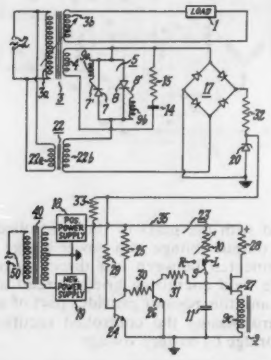
A voltage regulating system which is capable of controlling the output voltage of an alternating current generator which has a permanent magnet field, a main field winding and a reverse field winding. The voltage regulator utilizes thyristors or controlled rectifiers connected in a full-wave circuit with a plurality of diodes. The main field of the generator is connected across the direct current output terminals of the bridge circuit and its energization is controlled in accordance with the conduction of the controlled rectifiers. The reverse field winding of the generator is connected in series with another controlled rectifier having its gate-cathode circuit connected across the anode-cathode circuit of one of the controlled rectifiers of the bridge circuit. With this arrange-

ment the controlled rectifier connected with the reverse field winding is biased conductive when the bridge controlled rectifiers are biased nonconductive and this controlled rectifier is biased nonconductive when the bridge controlled rectifiers are biased conductive. The conduction of the bridge controlled rectifiers is controlled by a circuit which senses the output voltage of the generator.

3,609,515
CONSTANT CURRENT REGULATOR WITH PHASE CONTROL SWITCHING MEANS AND DC TRIGGERING MEANS THEREFOR

Robert E. Babcock, Hendersonville, and Wayne R. Neal, Fletcher, both of N.C., assignors to General Electric Company

Filed June 27, 1969, Ser. No. 837,014
Int. Cl. G05f *3/04*
U.S. Cl. 323—6 **11 Claims**

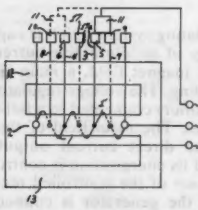


Current regulator device used for lighting circuits to control lamp brightness comprises a moving coil transformer having a main secondary winding connected to an illuminating load and an auxiliary secondary winding associated with the main secondary winding, and SCR phase control means connected to the auxiliary secondary winding for controlling the current therein and thereby the current in the main secondary winding and the load. The SCR control means are triggered by a transistor and pulse transformer circuit synchronized with the voltage from the alternating current supply which is rectified by a bridge circuit. A remote control circuit for operating the regulator to produce different brightness levels includes a plurality of parallel-connected transistor circuits having individually adjustable potentiometers.

3,609,516
SLIDE TRANSFORMER

Tsuneo Nagatoshi, 13-20, 1-chome, Yaguchi, Ofa-Ku, Tokyo, Japan

Filed Aug. 29, 1969, Ser. No. 854,050
Claims priority, application Japan, Oct. 1, 1968, 43/70821
Int. Cl. G05f *1/14*
U.S. Cl. 323—6 **3 Claims**



A slide transformer has two taps on each winding of a coil wound around the magnetic path of an iron core. The taps are connected to contacts respectively and a brush is slideable across these contacts. In a transformer with a shell-type iron core, one of these taps comes out of the upper side of the iron core, the other comes out of the lower side. In a transformer with a core-type iron core, one of the taps is connected to a contact through a hole provided in the magnetic path of the iron core, and the other is connected directly to the other contact.

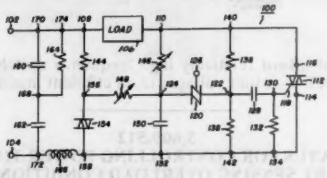
ERRATUM

For Class 323—16 see:
Patent No. 3,609,517

3,609,517
LINE VOLTAGE COMPENSATING POWER CONTROL CIRCUIT

Francis P. Tucker, Lynchburg, Va., assignor to General Electric Company

Filed Mar. 11, 1970, Ser. No. 18,516
Int. Cl. G05f *3/04*
U.S. Cl. 323—16 **17 Claims**

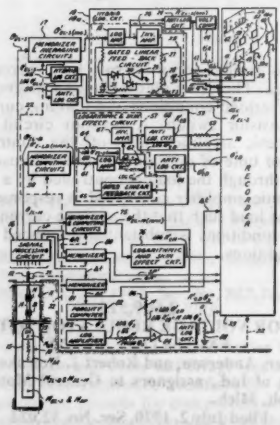


A circuit capable of controlling power application to a load while simultaneously reducing variations in line voltage employs a triac controlled by an SBS as a line switch. A potential divider and a diac referenced to opposite terminals of the SBS delay triac firing in response to line voltage increase. A resistor and capacitor attached to the triac gate protect the triac from inadvertent triggering.

3,609,518
LOGARITHMIC METHODS AND APPARATUS FOR PROCESSING WELL LOGGING SIGNALS

John H. Baker, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 7, 1968, Ser. No. 765,563
Int. Cl. G01v *3/18*
U.S. Cl. 324—1 **11 Claims**



In accordance with an illustrative embodiment of the present invention, logging measurements of radially shallow conductivity from an electrode logging tool, radially deep

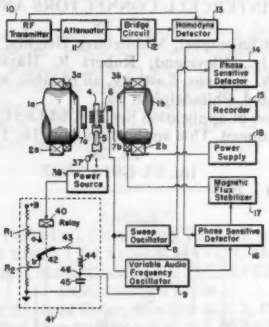
and medium conductivity from an induction logging tool, acoustic travel time from a sonic logging tool, as well as natural gamma-ray and spontaneous potential measurements are processed for recording as a function of borehole depth. More specifically, the shallow conductivity measurement signals are averaged and applied to a hybrid logarithmic circuit which operates to form a logarithm function thereof until the signal amplitude reaches a predetermined level at which time a linear function of the measurement signals is formed. The output signals from the hybrid logarithmic circuit are recorded with three separate degrees of resolution using only two galvanometers by multiplexing two signals on one galvanometer. A speedup circuit is utilized to prevent the galvanometer retrace from appearing on the recording medium. The induction logging signals are processed by suitable computing circuits to sharpen their resolution and then applied to hybrid logarithmic and skin effect circuits which, in addition to forming the logarithmic and linear functions, provides a skin effect correction. The resulting processed induction logging measurements are recorded with differing degrees of resolution and the radially deep measurement signals are combined with acoustic travel time derived porosity measurements to produce indications of the resistivity of the formation fluids.

3,609,519

APPARATUS FOR MAINTAINING FIELD FREQUENCY CONTROL IN A GYROMAGNETIC INSTRUMENT

Toshimasa Seki; Shoichi Hayashi; Kazuo Nakagawa; Shuichi Saito, and Hiroshi Toyama, all of Tokyo, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1968, Ser. No. 777,746
Claims priority, application Japan, Nov. 22, 1967, Feb. 27, 1968, July 31, 1968, Aug. 31, 1968, 42/74981;43/12496;43/54444;43/62519
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 **8 Claims**



An apparatus for automatically controlling the field/frequency ratio of a gyromagnetic resonance instrument during sample exchanging by automatically switching from the resonance parameters of an internal reference control within the unknown sample to the resonance parameter of an auxiliary control sample positioned within a space vacated by the unknown during exchange wherein the audio frequency, radio frequency or magnetic field are changed to compensate for deviations in the resonance parameter of the reference and control samples.

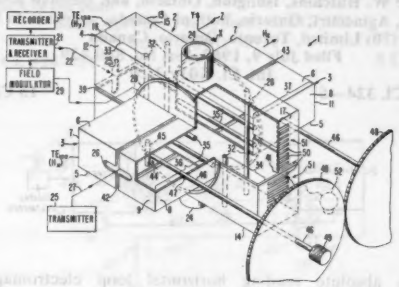
3,609,520

BIMODEL CAVITY RESONATOR FOR MICROWAVE SPECTROMETERS

Robert C. Sneed, Jr., Campbell, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Feb. 4, 1970, Ser. No. 8,651
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 **8 Claims**

A microwave spectrometer employing a bimodal cavity resonator for electron spin resonance experiments is disclosed. The bimodal cavity includes a shared region of space and an adjacent unshared region of space, such shared region being arranged to support two spatially orthogonal modes of oscillation and the unshared region of space being arranged to support the fields of only one of the modes of oscillation to the exclusion of the other. A set of conductive rods are disposed at the boundary of the adjacent shared and



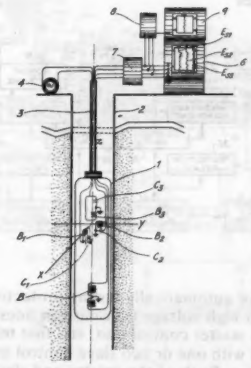
unshared regions, the rods being generally parallel to the magnetic field vector of the mode of oscillation which is common to both the shared and unshared regions and being generally perpendicular to the magnetic field vector of the mode which is to be excluded from the unshared region, whereby spatial orthogonality and positioning of the magnetic field of the two modes within the shared sample volume is enhanced.

3,609,521

ELECTROMAGNETIC LOGGING DEVICE AND METHOD UTILIZING THREE MUTUALLY PERPENDICULAR COILS FOR DETERMINING THE DIP OF DISCONTINUITIES IN THE ELECTRICAL RESISTIVITY OF UNDERGROUND FORMATIONS

Robert Desbrandes, Montesson, France, assignor to Institut Francais Du Petrole Des Carburants Et Lubrifiants, Rueil Malmaison (Hauts de Seine), France

Filed July 8, 1968, Ser. No. 743,198
Claims priority, application France, July 12, 1967, 114175
Int. Cl. G01v *3/10, 3/18*
U.S. Cl. 324—6 **9 Claims**



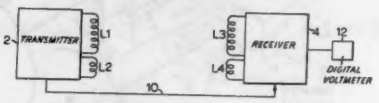
The presence of discontinuities in the areas of the earth surrounding a borehole are determined through induction logging. Three mutually perpendicular induction coils are spaced along the axis of the borehole from a transmitter coil. The signals generated by the transmitter coil are transmitted in a direction parallel to the axis of the borehole. By measuring the ratio of the magnitude of the signals received at the

mutually perpendicular receiving coils, the electrical discontinuity in the area surrounding the borehole can be determined as a function of the dip of the discontinuity.

3,609,522
HORIZONTAL LOOP ELECTROMAGNETIC PROSPECTING SYSTEM WITH TEMPERATURE COMPOSITION

Roger W. Hutchins, Islington, Ontario, and Herman Redderring, Agincourt, Ontario, both of Canada, assignors to Huntec (70) Limited, Toronto, Ontario, Canada

Filed July 9, 1969, Ser. No. 840,429
Int. Cl. G01v *3/10*
U.S. Cl. 324—6 **15 Claims**

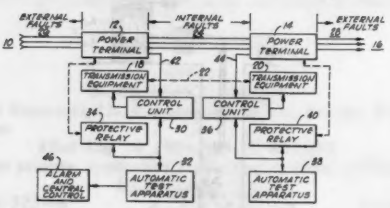


An absolute reading horizontal loop electromagnetic prospecting system in which the transmitted field is sampled by a reference coil concentric with and inductively coupled to the transmitter coil. The resultant reference voltage is used to adjust transmitter gain to keep transmitter output temperature independent. The receiver contains concentric, inductively coupled receiver and compensation coils, with a self-nulling servoloop connected between them employing in-phase and out-of-phase reference signals generated using the transmitter reference voltage. The servoloop detects the in-phase and out-of-phase components of the received signal, integrates them, and feeds the in-phase and out-of-phase components of the integrated signals into the compensation coil, with a free space compensation signal, to null the received signal. A digital voltmeter measures, through an optional long time constant filter, the size of the integrated signals to indicate the in-phase and out-of-phase components of the received signal.

3,609,523
AUTOMATIC TEST APPARATUS FOR PHASE COMPARISON PROTECTIVE RELAY SYSTEMS AND THE LIKE

Marion D. Knox, Oklahoma City, Okla., assignor to Wayne Electronic Products Company

Filed Apr. 2, 1969, Ser. No. 812,770
Int. Cl. G01r *31/02*
U.S. Cl. 324—28 **13 Claims**

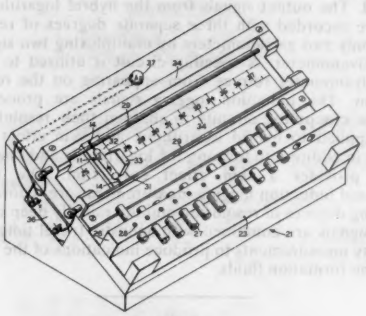


Apparatus for automatically testing protective relay system as utilized with high voltage transmission lines, the apparatus consisting of a master control unit, at a first terminal working in conjunction with one or two slave control units at adjacent terminal stations. Each of the master and slave control units are controlled through a cycle of actuation by a synchronous timer means such that a programmed series of switch closures performs a test of associated transmission and reception equipment and the respective protective relay devices to transmit starting signal, ring back, internal and external simulated faults and a selected security code. Each test control unit utilizes a time-controlled program switch which is synchronously operable to effect various test and verify operations in the control unit.

3,609,524
APPARATUS FOR DETERMINING THE "OPERATE" VALUE OF SEALED CONTACTS

Edward J. Kazmer, Allentown, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed May 7, 1969, Ser. No. 822,669
Int. Cl. G01r *31/02*
U.S. Cl. 324—28 RS **8 Claims**

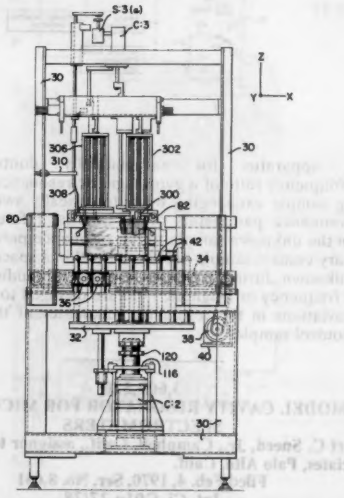


The "operate" value of a sealed contact is determined by: arranging rod-shaped permanent magnets so as to obtain an elongated magnetic field, the flux density of which increases from one end to the other; placing the sealed contact in the magnetic field; and moving the contact along the field in the direction of increasing flux density until it operates. The strength of the magnetic field at the point of operation reveals the "operate" value of the sealed contact.

3,609,525
MACHINE USED IN ELECTRICALLY TESTING BATTERY INTERCELL CONNECTORS AND TERMINAL POSTS

William R. Clingenpeel, Middleburg Heights; Philip C. Hungerford, Jr., Cleveland; Robert R. Hayes, Euclid, and Thomas W. Jennens, Eastlake, all of Ohio, assignors to ESB Incorporated, Philadelphia, Pa.

Continuation of application Ser. No. 643,631, June 5, 1967, now abandoned. This application Apr. 16, 1970, Ser. No. 28,226
Int. Cl. G01n *27/42*
U.S. Cl. 324—29.5 **19 Claims**



A machine used in electrically testing battery intercell connectors and terminal posts. The machine includes electrical

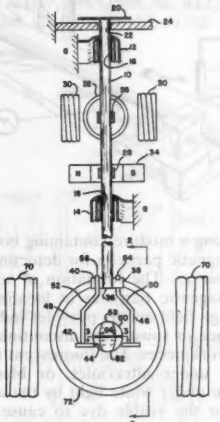
probes which, when used with appropriate electrical test circuits, can determine whether the connectors and posts are properly constructed and connected to the cell element.

3,609,526

CONTACTLESS METHOD AND APPARATUS FOR DETERMINING ELECTRICAL RESISTIVITY

Aleksander Z. Chaberski, 717 Ellicott St., Buffalo, N.Y.

Filed June 24, 1969, Ser. No. 836,113
Int. Cl. G01r *33/12*
U.S. Cl. 324—34 **14 Claims**



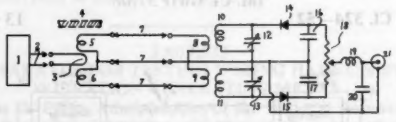
A method and apparatus for determining the electrical resistivity of a sample, which comprises; suspending the sample in a rotating magnetic field in such an orientation that the flux penetration of the sample by the field is a maximum, determining the torque imparted to the sample by the field and determining the volumetric moment of inertia of the sample whereby the resistivity of the sample can be calculated.

3,609,527

NONCONTACTING PROXIMITY GAGE UTILIZING INDUCED EDDY CURRENTS, HAVING IMPROVED DYNAMIC RESPONSE AND INTERFERENCE DISCRIMINATION

James F. Ellis, Skyland Drive, Box 248 Rte. 2, Powell, Tenn.

Filed May 26, 1969, Ser. No. 827,630
Int. Cl. G01r *33/00*
U.S. Cl. 324—40 **8 Claims**



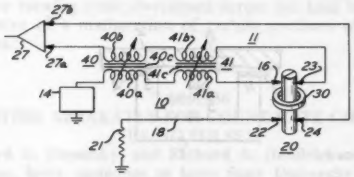
This invention relates to distance measuring instruments utilizing the effects of induced eddy currents. It features a differential probe operating at low impedance, high frequency, and so matched to its input and output lines that it serves as a differential coupler rather than a resonance slope detector. One embodiment utilizes a tuned differential detector and another employs a phase splitter and a tuned logarithmic amplifier for fast linearized response. The use of low impedances, tight coupling, and a system of common mode rejection make the device insensitive to all signals except the desired differential carrier signal. The device is capable of very fast response in hostile environments.

3,609,528

NOISE PULSE CANCELLATION SYSTEM FORMED BY A PAIR OF TRANSFORMERS

Nathan R. Smith, Willingboro, N.J., assignor to Computer Test Corporation

Filed Apr. 21, 1969, Ser. No. 817,686
Int. Cl. G01r *33/12*
U.S. Cl. 324—34 R **8 Claims**



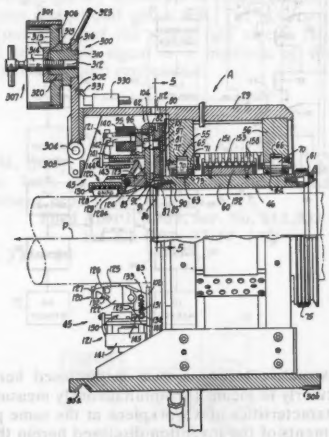
In testing magnetic memory cores, a core is mounted on a split conductor probe and a current pulse is applied to an input of the probe and there is produced at an output thereof an output voltage pulse and a noise pulse. A cancellation transformer is connected so that the current pulse applied to the input produces a noise cancellation pulse at the output. The magnetizing inductance of the transformer is adjusted to change the timing and amplitude of the cancellation pulse to coincide in time and amplitude with the noise pulse.

3,609,529

METHOD AND APPARATUS FOR DETECTING DEFECTS IN ARTICLES MOVING ALONG A PATH OF TRAVEL

John Şkubiak, Oakland County, Mich., and John A. Toth, Cuyahoga County, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Jan. 24, 1969, Ser. No. 793,807
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 **23 Claims**



Apparatus for electrically detecting and marking defects in metal articles includes inspection devices for orbiting about a moving article to detect flaws in the article, a logic unit associated with the inspection devices for processing inspection information provided by the devices, and a marker unit operated by output signals from the logic unit to mark the locations of the flaws.

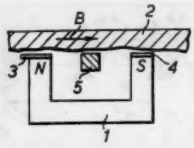
The disclosed apparatus also includes a calibration device for quick and simple calibration of the inspection devices.

3,609,530

MAGNETIC LEAKAGE FIELD FLAW DETECTOR WITH COMPENSATION FOR VARIATION IN SPACING BETWEEN MAGNETIZER AND TEST PIECE

Alan Braid Johnson, Abingdon, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Mar. 6, 1969, Ser. No. 804,916
Claims priority, application Great Britain, Mar. 13, 1968, 12306/68
Int. Cl. G01r 33/12
U.S. Cl. 324—37 **6 Claims**



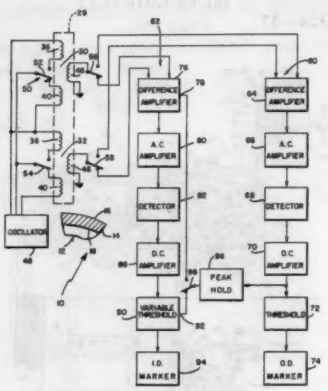
A device for sensing magnetic discontinuties comprises a magnet for inducing magnetism in a sample, and a detector and amplifier for detecting the induced magnetism. A Hall effect crystal is included in the flux path between the magnet and the specimen. The Hall effect crystal is arranged to control the detector amplifier so as to nullify the effect of variations in the gap between magnet and specimen.

3,609,531

COMBINED LEAKAGE FIELD AND EDDY CURRENT FLAW DETECTOR

Friedrich M. O. Forster, Der Schoene Weg 144, 741 Reutlingen, Germany

Filed Oct. 25, 1967, Ser. No. 677,990
Int. Cl. G01r 33/12
U.S. Cl. 324—37 **15 Claims**



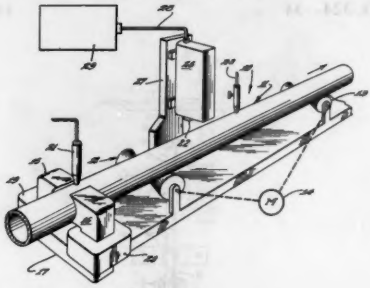
A nondestructive testing system is disclosed herein and more particularly to means for simultaneously measuring two different characteristics of a workpiece at the same point. In the embodiments of the invention disclosed herein this is accomplished by providing a pickup probe for scanning the workpiece and substantially simultaneously sensing any fields which are reradiated from eddy currents produced in the workpiece by the probe and any magnetic stray fields produced as a result of magnetizing the workpiece. Means are also provided which are responsive to these fields for indicating whether the fields are produced by defects in the surface scanned by the probe or defects buried beneath the surface.

3,609,532

METHOD OF DETECTING INHOMOGENEITIES BY THE USE OF MIXTURES OF FLUORESCENT AND VISIBLE DYE-COLORED MAGNETIC PARTICLES

Keith M. Van Kirk, Palatine, and Kenneth P. Borrows, Chicago, both of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed July 25, 1969, Ser. No. 845,012
Int. Cl. G01r 33/12
U.S. Cl. 324—38 **11 Claims**



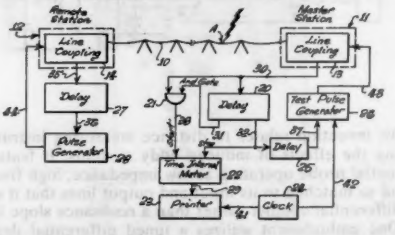
A method using a mixture containing both fluorescent and visible dyed magnetic particles for detecting inhomogeneities in metal workpieces. The formation of adherent accumulations of the magnetic particles at localized areas where a magnetic leakage field occurs provides indications of the existence of surface or subsurface discontinuities or the like in magnetizable workpieces. The fluorescent indications are initially detected under ultraviolet, or black light, and are rendered visible under white light by the application thereto of a solvent for the visible dye to cause bleeding thereof. Preferably, the solvent contains a light-colored pigment suspended therein to afford a contrasting background for the visible color indication, and also contains a thickening agent, resin or the like to increase the viscosity of the solvent and thereby limit the extent of bleeding of the visible dye. Compositions comprising mixtures of the respective fluorescent and visible dyed particles are applied to the surface undergoing test either in dry powdered form or in the form of suspensions of such particles in a common liquid vehicle that is a nonsolvent for the particles and also for the visible dye associated with the visible dyed particles. The visible color indications formed by the subsequent application of a solvent for the visible dye, and consequent bleeding of the visible dye enable operators to carry out under ordinary, or white light, whatever scarfing or other treatment is required to remove the surface discontinuity from the workpiece or to compensate for it.

3,609,533

FAULT LOCATING SYSTEM FOR DETERMINING DISTANCE OF FAULT ON A TRANSMISSION LINE FROM A PREDETERMINED POSITION THEREON

Robert J. Pardis, 1247 Carmel Drive, Simi, Calif.

Filed Dec. 11, 1968, Ser. No. 782,935
Int. Cl. G01r 31/08
U.S. Cl. 324—52 **13 Claims**



A system for accurately and automatically determining the location of a fault occurring on a high-voltage electric power

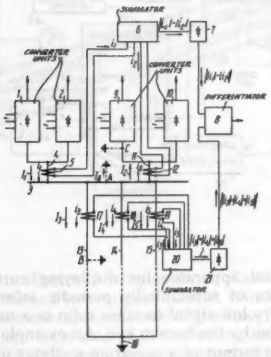
transmission line. A time interval measuring unit is located at one station on the line; the fault pulse is transmitted to the measuring unit as a first pulse through another station and a first delay. The fault pulse is transmitted to the measuring unit as a second pulse through the one station and a second delay, with the measured interval between arrival of the first and second pulses providing a measure of the distance of the fault from the one station.

3,609,534

DEVICE UTILIZING DC TRANSFORMERS FOR SELECTIVE LOCATION OF EARTH CONNECTION WITHIN BUS SYSTEM

Albert Efimovich Gurevich, Novosivkovskaya ulitsa, 1a, kv. 13, Leningrad, U.S.S.R.

Filed May 7, 1969, Ser. No. 822,631
Int. Cl. G01r *31/02, 31/08*
U.S. Cl. 324—52 **2 Claims**



A device for selective location of an earth connection within a bus system adapted to interconnect the converter units and the external earthing of a converting substation employed in a H.T. direct-current electric transmission line, comprising DC transformers inserted both into each circuit adapted to connect the converter units of the like polarities to the bus system and into each earthing system; the secondary currents supplied from said transformers are fed to the differentiator through two summator and two rectifiers, one of the summators being adapted to effect subtraction of absolute magnitudes of the secondary currents characterizing the condition of the converter circuits of the unlike polarity, whereas the other summator is adapted to effect summing up of the absolute magnitudes of the secondary currents, characterized in that the condition of the earthing circuits. The signal produced by the differentiator is the evidence of the occurrence of an earth connection.

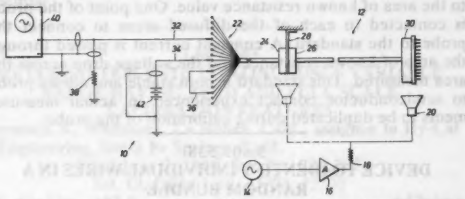
3,609,535

APPARATUS FOR TESTING WIRING HARNESS BY VIBRATION GENERATING MEANS

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; David E. Roberts, Joshua Tree, Calif., and Sidney M. Grieve, Van Nuys, Calif.

Filed Dec. 31, 1969, Ser. No. 889,479
Int. Cl. G01r *31/02, 31/08*
U.S. Cl. 324—52 **2 Claims**

An apparatus which tests wiring harnesses, terminal trips, sockets and plugs, which includes an audio oscillator, an amplifier, and a very substantial high-power speaker horn directed at the apparatus being tested, which is configured immediately in front of the horn, and further including a DC voltage source in series with a load impedance utilizing selected portions of the wiring harness and other associated equipment to complete a circuit therewith, and an oscilloscope viewing noise developed across the load impedance indicative of a malfunction of certain portions of said apparatus.

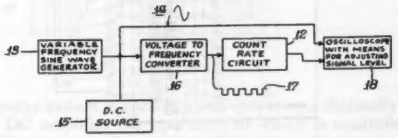


3,609,536

TESTING APPARATUS FOR COUNT RATE CIRCUITS USING PULSES

Richard A. Danofsky, and Richard A. Hendrickson, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa

Filed Dec. 14, 1967, Ser. No. 690,532
Int. Cl. G01r *27/00*
U.S. Cl. 324—57 **7 Claims**


VARIABLE FREQUENCY SINE WAVE GENERATOR
VOLTAGE TO FREQUENCY CONVERTER
COUNT RATE CIRCUIT
OSCILLOSCOPE WITH MEANS FOR ADJUSTING SIGNAL LEVEL
D.C. SOURCE

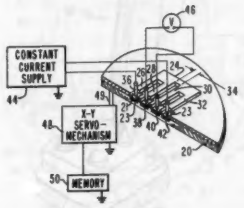
The output signal of a variable frequency sine wave generator is superimposed on a DC level to generate a unipolar signal with sinusoidally varying amplitude. This signal drives a voltage-to-frequency converter which generates a train of pulses of constant amplitude and width, and has a repetition rate proportional to the instantaneous amplitude of the sine wave signal. The output signal of the voltage-to-frequency converter is fed to the input terminals of a count rate circuit under test. The accuracy with which the output signal of the count rate circuit reproduces the original sine wave signal is a measure of the frequency response of the count rate circuit.

3,609,537

RESISTANCE STANDARD

Albert M. Healy, Essex Center, and Donald M. Kenney, Shelburne, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1969, Ser. No. 811,933
Int. Cl. G01r *27/14, 1/02*
U.S. Cl. 324—64 **11 Claims**



A resistance standard for calibrating four-point probes used to measure resistances of semiconductor material has a

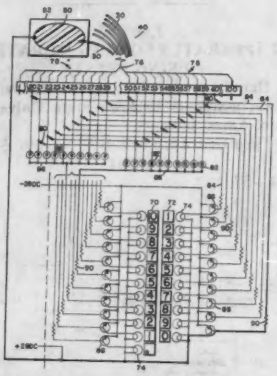
metal pattern having an area of known resistance value deposited on the surface of a semiconductor wafer. Four diffused areas of opposite conductivity to the remainder of the wafer are disposed adjacent to and are electrically connected to the area of known resistance value. One point of the probe is contacted to each of the diffused areas to connect the probe to the standard. A constant current is passed through the area of known resistance and the voltage drop across the area measured. This standard is both stable and allows probe to semiconductor contact experienced in actual measurements to be duplicated during calibration of the probe.

3,609,538

DEVICE TO IDENTIFY INDIVIDUAL WIRES IN A RANDOM BUNDLE

Ronald H. Schag, Orange, Calif., assignor to Thomas & Betts Corporation

Filed Apr. 4, 1969, Ser. No. 813,482
Int. Cl. G01r *31/02*
U.S. Cl. 324—66 **4 Claims**



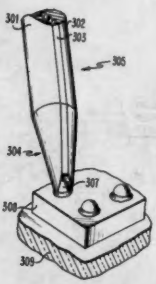
A wire detector for determining the designation of a wire in a random bundle of wires which are connected at a first end to a group of designatory points, comprising connection means between said group of designatory points and a display device; a probe for contacting the second end of a wire in said bundle; said probe being coupled to said display device to complete a circuit through the selected wire, which causes the display device to indicate the designation thereof by displaying a predesignated symbol. The disclosure also sets forth various probes which permit wire identification without the need for prestripping or piercing of the wire insulation and which permits wire identification to be made at an extended distance.

3,609,539

SELF-ALIGNING KELVIN PROBE

Richard J. Gunthert, Wappingers Falls, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Sept. 28, 1968, Ser. No. 755,868
Int. Cl. G01r *31/02*
U.S. Cl. 324—72.5 **3 Claims**



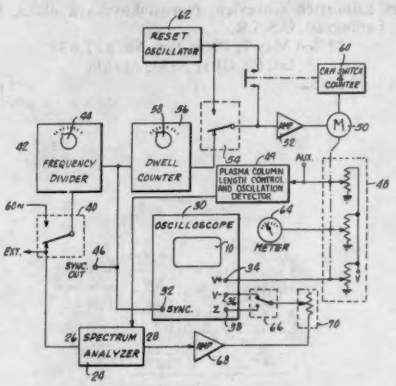
Electrical contact device for Kelvin probing comprising two contact bars separated by an insulator, said bars having self-aligning shaped contact ends for self-aligning upon a protruding electrical contact on the body to be probed.

3,609,540

RASTER DISPLAY METHOD AND APPARATUS

Herbert Lashinsky, Bethesda, and Robert E. Monblatt, Bowie, both of Md., assignors to Research Corporation, New York, N.Y.

Filed Mar. 2, 1970, Ser. No. 15,400
Int. Cl. G01n *23/16*
U.S. Cl. 324—77 G **17 Claims**



Method and apparatus for displaying current and past characteristics of substantially periodic information which may have very low signal-to-noise ratio in a manner enhancing perception by the human eye. An example of such information is the output of a spectrum analyzer using in plasma studies. Also, method and apparatus for converting an oscilloscope which conventionally presents a dependent variable as a function of time into an X-Y plotter which presents the same dependent variable as a function of another variable which is independent. An inherent desirable feature is automatic adjustment of correspondence between full scale of the dependent variable and full-scale excursion of independent variable.

The information of interest is displayed in a raster created on a CRT oscilloscope having a long decay-time screen or by a time-exposure photograph on a standard camera attachment by externally triggering the horizontal sweep in harmonic relationship with the cycle of periodic information, stepping the vertical deflection incrementally in harmonic relationship with the same cycle, and using the periodic information for either beam-intensity modulation or vertical deflection modulation. The resulting display is in the form of a raster of horizontal scan lines in which noise appears as randomly distributed indicia while the periodic information produces an easily perceptible to the human eye ordered set of indicia. In a first application, the raster display is a plot of the periodic information in two time domains: the horizontal axis is a measure of the time of occurrence of the periodic information within a cycle, and the vertical axis is a measure of the number of cycles of occurrence. Perfectly periodic information signals produce a vertical line made up of individual indicia, while a drifting information signal produces a sloping line made up of individual indicia. The slope is a measure of the instantaneous rate of drift.

In a second application, the raster display is a plot of a dependent variable versus an independent variable, which plot is not in the time domain. The raster-display thus serves as an X-Y plotter.

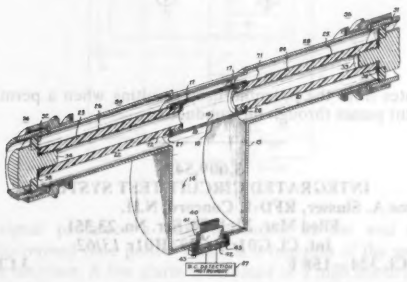
The signal-to-noise ratio of the information signal may be enhanced by operating in dwell mode in which horizontal scans are repeated while the total number of displayed scan lines remains constant. Particular advantages derive from provisions for: fast advance and reset of the raster building circuit so that a partially completed experiment can be ter-

minated and the raster display returned to initial state quickly; generating exceedingly stable staircase voltage so that a scan line taking several seconds can remain straight; indicating the current scan line position—useful when the camera attachment obscures the screen; protection of the raster from accidental erasure; automatically controlled camera operation; and automatic beam intensity adjustment when switching between using the periodic information for beam-intensity modulation.

3,609,541
RADIO FREQUENCY COAXIAL AMMETER WITH THERMAL COMPENSATION

Winston W. Scott, Jr., Boulder, Colo.

Filed Jan. 20, 1970, Ser. No. 4,372
Int. Cl. G01r *21/04, 5/26*
U.S. Cl. 324—95 **9 Claims**

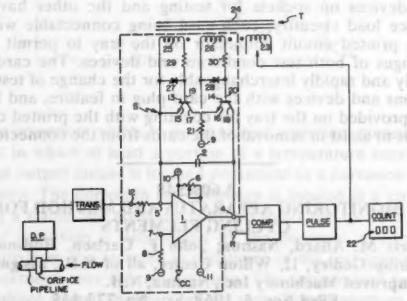


A cylindrical reflector, having an inner elliptical reflecting surface, is positioned in a coaxial line. A thin-film heater is connected to the center conductor of the line. The heater is located along one focal axis of the reflecting surface and the hot junctions of a thermopile are located along the other focal axis. Input current causes the heater to radiate infrared energy which is reflected and focused onto both sides of the hot junctions. The resulting electrical output of the thermopile is proportional to radiated power and consequently input current squared, and because of thermal compensation the output is substantially independent of ambient and self-heating temperature changes.

3,609,542
INSTRUMENTS HAVING INTEGRATING-TYPE CIRCUITS THEREIN

Robert H. Burke, Penfield, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

Filed May 2, 1969, Ser. No. 821,279
Int. Cl. G01r *1/00;* **H03k** *17/06*
U.S. Cl. 324—111 **8 Claims**

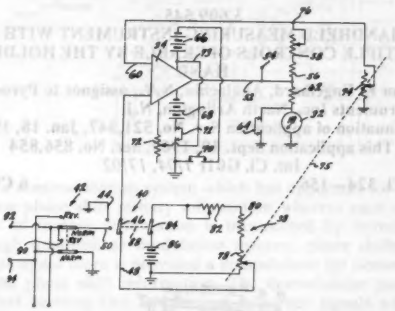


Integrating type circuit having a two-transistor capacitor-discharging switch. In "off" condition, transistor leakage current is shunted away from the capacitor. The transistors are connected together, emitter to collector, in series across the capacitor and by a resistance connected to said emitter and said collector, to a reference potential.

3,609,543
METER SYSTEM WITH CONTINUOUSLY VARIABLE RANGE HAVING ZERO AND FULL SCALE CALIBRATION FEATURES

Raymond A. Whitmore, La Habra, Calif., assignor to Hy-Cal Engineering, Santa Fe Springs, Calif.

Filed June 2, 1969, Ser. No. 829,205
Int. Cl. G01r *1/30, 15/08, 35/00*
U.S. Cl. 324—123 R **4 Claims**

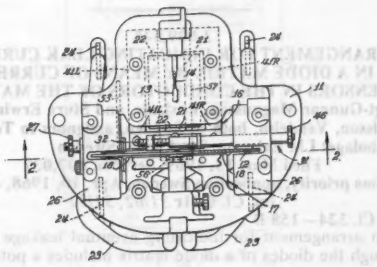


A meter system is disclosed incorporating a thermally insulated DC amplifier the operation of which is controlled by variable gain and trim resistors. The system also incorporates a calibration circuit for providing variable voltages in accordance with the setting of a potentiometer. The potentiometer of the calibration circuit and the variable gain resistor are ganged together to simplify calibration of the operating range for input signals applied to the amplifier, the output of which is in turn applied to a meter movement having substantial angular range. Various accessory package circuits are also disclosed for use in conjunction with the basic metering system to increase the utilization of the system.

3,609,544
WATT-HOUR METER WITH SHIFTING SCREW AS LIGHT LOAD ADJUSTMENT

James W. Milligan, West Lafayette; Russell F. Graefnitz, Lafayette, and George N. Burkhart, Jr., Brookston, all of Ind., assignors to Duncan Electric Company, Inc., Lafayette, Ind.

Filed July 9, 1969, Ser. No. 840,264
Int. Cl. G01r *11/02*
U.S. Cl. 324—138 **9 Claims.**



A watt-hour meter for alternating current is adjusted for accuracy of measurement of light loads by shifting a unitary

part, preferably a screw unit, which is the only part that moves for this adjustment. The phasing plate which heretofore has been movable for light load adjustment is now fixed in position, dispensing with the relatively complicated means for achieving accurate light load adjustment by its movement. The illustrated moving adjustment structure of screw unit consists solely of a screw of magnetic metal carrying conductive sleeve means fixed thereon. The most effective part of the sleeve is copper. The screw can be turned from the front of the meter with a screwdriver and the threads are engaged under resilient tension to avoid backlash. The screw carries leakage flux between the central pole and two side poles. The movement of the screw unit varies the light load compensation by increasing the effect of the unit as to one side and decreasing it as to the other side, thus changing the magnetic dissymmetry.

3,609,545

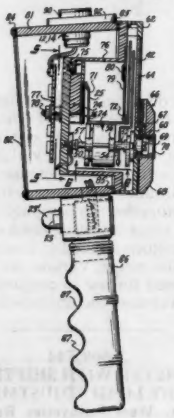
HANDHELD MEASURING INSTRUMENT WITH MULTIPLE CONTROLS OPERABLE BY THE HOLDING HAND

William E. Engelhard, Apalachin, N.Y., assignor to Pyro-Serv Instruments Inc., North Arlington, N.J.

Continuation of application Ser. No. 521,347, Jan. 18, 1966. This application Sept. 10, 1969, Ser. No. 856,854

Int. Cl. G01r *1/04, 17/02*

U.S. Cl. 324—156 **6 Claims**



A hand-grasped measuring instrument having a plurality of controls all of which are separately and selectively operable by the fingers and thumb of the hand grasping the instrument.

3,609,546

ARRANGEMENT FOR INDICATING LEAK CURRENTS IN A DIODE MATRIX BY MEANS OF CURRENT SENSORS IN THE CONDUCTORS OF THE MATRIX

Bengt-Gunnar Magnusson, Enskede, and Sture Erwin Hilding Nilsson, Vendelso, both of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

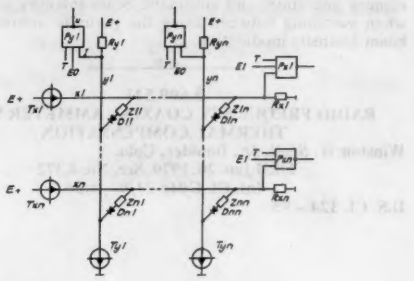
Filed Mar. 13, 1969, Ser. No. 807,037

Claims priority, application Sweden, Apr. 10, 1968, 4852/68

Int. Cl. G01r *31/02, 31/22*

U.S. Cl. 324—158 D **1 Claim**

An arrangement for indicating eventual leakage currents through the diodes of a diode matrix includes a potential-indicating means connnected to each conductor of the matrix. The deteriorating operation of any of the diodes causes a potential drop in the associated potential which signifies means indicating the conductor to which the faulty diode is connected. Each potential-indicating means is adjusted to give an indication when the potential drop reaches a value including a certain safety factor determined in advance which



deviates from the potential drop resulting when a permitted current passes through the conductor.

3,609,547

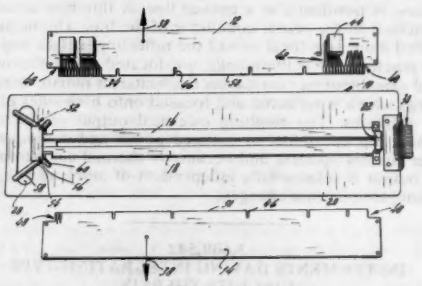
INTEGRATED CIRCUIT TEST SYSTEM

Eugene A. Slusser, RFD-1, Concord, N.H.

Filed Mar. 27, 1970, Ser. No. 23,351

Int. Cl. G01r *31/22;* **H01r** *13/62*

U.S. Cl. 324—158 F **3 Claims**



An integrated circuit test system useful for component testing in a temperature chamber or oven under high heat conditions and including a tray having incorporated thereon printed circuit and connectors and two cards, one for mounting devices on sockets for testing and the other having a device load circuitry, each card being connectable with its own printed circuit connector on the tray to permit rapid changes of both test conditions and devices. The cards are easily and rapidly interchangeable for the change of test conditions and devices with the card plug in feature, and levers are provided on the tray for coacting with the printed circuit cards to assist in removal of the cards from the connectors.

3,609,548

MONITORING APPARATUS AND METHOD FOR CYCLING ELEMENTS

Harrie M. Allard, Nashua; John F. Carlson, Hudson, and Philip Godley, II, Wilton Center, all of N.H., assignors to Improved Machinery Inc., Nashua, N.H.

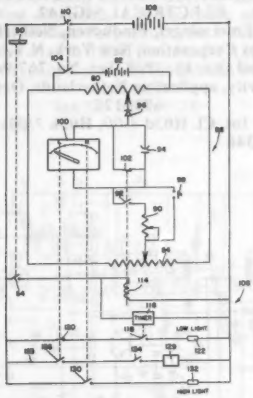
Filed Nov. 5, 1968, Ser. No. 773,445

Int. Cl. G01p *3/56*

U.S. Cl. 324—161 **8 Claims**

This is an apparatus for monitoring the movement of a moveable member which moves from an initial position to a

second position at varying speeds. A timer is actuated when the member moves from its initial position. A component in an electrical circuit connected to the member produces an electrical signal proportional to the instantaneous position of the member. An electrical indication which is responsive to



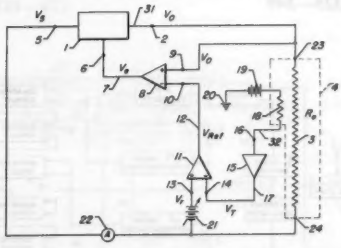
the signal produces a final indication at the end of a predetermined time period which is a function of the speeds of the member. A low alarm is actuated or a high alarm is actuated if the distance of the moveable member from the initial position at the end of the predetermined time period is less or more respectively than desired.

3,609,549

CORROSION-MEASURING DEVICE

Rudolf H. Hausler, Rolling Meadows, and Robert W. Sampson, Arlington Heights, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed June 15, 1970, Ser. No. 46,346
Int. Cl. G01n *27/04, 27/30*
U.S. Cl. 324—65 C **4 Claims**



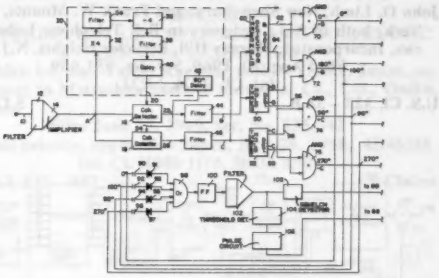
This invention relates to an improved corrosion-measuring device in which at least a portion of a temperature sensitive voltage output means is located proximate to a corrosion test specimen. The corrosion test specimen is located in a circuit having a stable and normally constant input voltage. The extent of corrosion is determined by the decrease in current resulting from the increase in resistance of the test specimen as it corrodes over a period of time. The temperature sensitive voltage output means is at the same temperature as the test specimen and adjusts the input voltage to negate the effects of varying temperature on the current flowing through the test specimen.

3,609,550

DEMODULATOR FOR TRANSMITTED PHASE MODULATED TERNARY INFORMATION

Edward Guyer, Los Angeles, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of application Ser. No. 568,209, July 27, 1966, now abandoned. This application June 6, 1969, Ser. No. 833,886
Int. Cl. H04l *27/14*
U.S. Cl. 325—30 **4 Claims**



In a communication system which has apparatus for transmitting phase shift ternary information wherein each of the items of ternary information is transmitted by introducing through quadriphase modulation discreet phase shifts in a carrier signal there is provided a demodulator for demodulating the phase shift information. The demodulator provides for first deriving first and second reference signals wherein the first reference signal has a predetermined phase delay with respect to the carrier signal, and the second reference signal has another predetermined phase delay with respect to the first reference signal. Also provided for is the comparing of the carrier signal and the reference signals to provide a pair of output signals containing the phase shift ternary information. The pair of output signals is then converted to provide the ternary information.

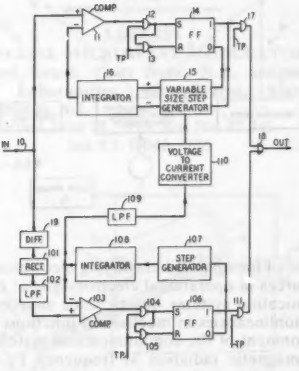
This invention relates to a communication system wherein ternary information transmission is effected by phase modulating the carrier or subcarrier signals, and more particularly relates to a demodulator for the phase modulated ternary information.

3,609,551

DISCRETE-CONTINUOUS COMPANDING FOR A DIGITAL TRANSMISSION SYSTEM

James M. Brown, Holmdel, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, Berkeley Heights, N.J.

Filed June 28, 1968, Ser. No. 741,180
Int. Cl. H03k *13/22*
U.S. Cl. 325—38 **5 Claims**



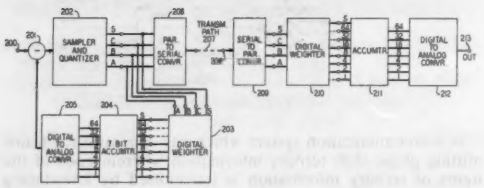
A delta modulation transmission system is disclosed in which the message signal is, effectively, compressed at the

transmitter and, effectively, complementarily expanded at the receiver. The transmitter includes a variable size step pulse generator to provide the pseudocompression and means are provided to vary the magnitude of the step pulse discretely over a part of the dynamic range of the message signal and continuously over another part of the dynamic range of the message signal.

3,609,552
DIFFERENTIAL PULSE CODE COMMUNICATION SYSTEM USING DIGITAL ACCUMULATION

John O. Limb, New Shewsbury, and Frank W. Mounts, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 20, 1969, Ser. No. 851,639
Int. Cl. H03k *13/22*
U.S. Cl. 325—38 B **5 Claims**

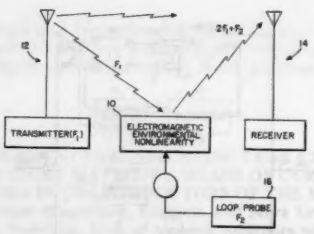


A differential pulse code communication system is disclosed which digitally accumulates the difference signal in order to eliminate the matching problem inherent in prior art systems. In the transmitter the difference signals are digitally accumulated and converted to analog form for subtraction from the input signal, and at the receiver the difference signal is accumulated before it is converted to analog form to reconstruct the input signal.

3,609,553
DETECTION AND CLASSIFICATION OF NONLINEARLY GENERATED ENVIRONMENT INTERFERENCE SOURCES BY USE OF A VERIFIER SYSTEM

Marvin J. Frazier, Wood Dale; Sam Tumarkin, Chicago; Edwin A. Wilson, Chicago, and Raymond F. Elsner, Lombard, all of Ill.

Filed July 30, 1969, Ser. No. 846,091
Int. Cl. H04b *1/00*
U.S. Cl. 325—67 **7 Claims**

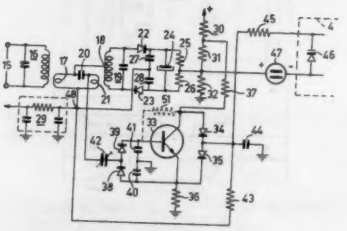


A method of locating and classifying electromagnetic interference sources in operational electromagnetic environments of communication systems. Interference sources comprising electrical nonlinearities in mechanical junctions of the structural environment of the communications system are excited by electromagnetic radiation at frequency F_1 from system transmitters and by induced signals at frequency F_2 from a loop probe held in close proximity to the sources to create harmonic and intermodulation product signals. These signals are sensed on system receiving antennas operating in the operational electromagnetic environment. The levels of the sensed signals determine whether the interference sources are interference contributors, noncontributors or localized interference sources, or parasitic elements.

3,609,554
CIRCUIT ARRANGEMENT FOR SWITCHING AN ELECTRICAL SIGNAL

Albert Stoker, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 16, 1968, Ser. No. 767,948
Claims priority, application Netherlands, Oct. 18, 1967, 6714120
Int. Cl. H03d *3/00;* **H03k** *7/00*
U.S. Cl. 325—346 **4 Claims**

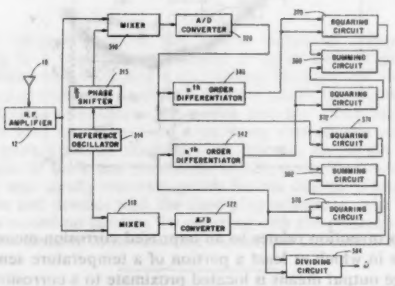


A circuit for switching a connection point from variable signal to a reference potential, employing a transistor having its control electrode connected to a variable DC voltage, and its emitter-collector path connected by resistors between a potential divider and a reference point. A pair of similarly poled diodes are connected across the emitter-collector path, the junction of said diodes connected to said connection point.

3,609,555
DIGITAL FM RECEIVER

Richard Van Blerkom, Rockville; Don G. Freeman, Gaithersburg, and Richard C. Crutchfield, Potomac, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 19, 1967, Ser. No. 654,412
Int. Cl. H03d *3/00*
U.S. Cl. 325—349 **5 Claims**



A digital FM receiver for receiving information in the form of analog signals on a frequency-modulated carrier at its input and providing said information in digital form at its output. The input signal consisting of a subcarrier modulated by the analog information (baseband) is converted into digital form in an analog to digital converter and is then demodulated in a digital demodulator, providing at its output the baseband information in digital form. The invention herein

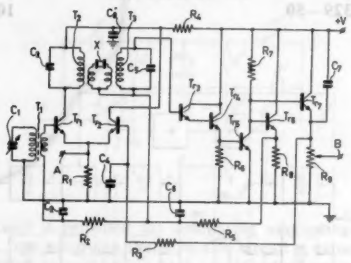
described was made in the course of or under a contract with the United States Air Force.

3,609,556

FIXED BIAS SUPPLY ARRANGEMENT FOR LONG TAILED PAIR TRANSISTOR CONFIGURATION

William Douglas Benson, Sutton, Surrey, and John Stuart Malcolm, West Norwood, London, both of England, assignors to U.S. Phillips Corporation, New York, N.Y.

Filed May 7, 1968, Ser. No. 727,273
Claims priority, application Great Britain, May 9, 1967, 21,421/67
Int. Cl. H04b *1/28*
U.S. Cl. 325—430 **5 Claims**



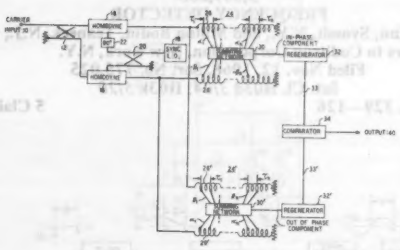
A circuit arrangement comprising a DC coupled amplifier and at least a preceding stage incorporating a pair of transistors, the bias for an electrode of each transistor of said preceding stage being derived from said DC coupled amplifier, each being determined by a multiple being on integer of the bias-emitter junction potential of transistors incorporated in said DC amplifier.

3,609,557

APPARATUS AND METHOD FOR BASEBAND DETECTION AND EQUALIZATION OF INFORMATION SIGNALS

James E. Goell, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 8, 1969, Ser. No. 882,899
Int. Cl. H04b *1/16*
U.S. Cl. 325—473 **14 Claims**



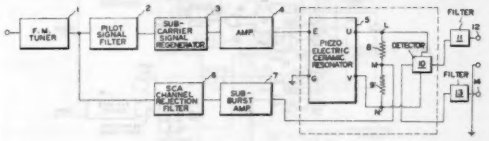
Baseband detection and equalization of a signal having arbitrary modulation and distortion is achieved by linearly down-converting the signal to baseband be means of a pair of homodynes driven by a synchronous local oscillator. Each of the homodyne outputs (i.e., the in-phase and out-of-phase components) is equalized by a baseband transversal equalizer comprising a pair of delay lines having a tap separation not greater than $1/\Delta f$, where Δf is the bandwidth over which equalization is desired. The taps of each delay line are coupled through attenuators to a summing network, the output of which is the in-phase (or out-of-phase) component equalized depending on whether the attenuation levels correspond to $(\alpha_n,-\beta_n)$ or (β_n,α_n), respectively, where α_n and β_n are, in a frequency-domain analysis, the coefficients of the Fourier series of the Fourier transform of the system component or apparatus producing the distortion. Alternatively, α_n and β_n can be determined from a time-domain analysis in which α_n and β_n are chosen such that the signal is set to zero at a sufficient number of sampling instants to allow satisfactory transmission.

3,609,558

SWITCHING DEVICE EMPLOYING A PIEZOELECTRIC CERAMIC RESONATOR

Yukihiko Ise, and Yuichi Kaname, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed June 23, 1969, Ser. No. 835,342
Claims priority, application Japan, June 26, 1968, 43/45343
Int. Cl. H04b *1/16*; **H03k** *3/00*
U.S. Cl. 325—487 **6 Claims**



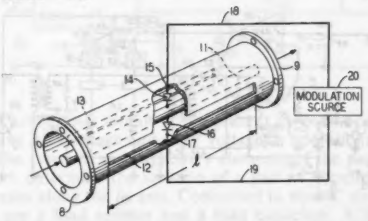
A switching device has a piezoelectric ceramic resonator having a grounded terminal, an input terminal which is supplied with a subcarrier signal to give said piezoelectric ceramic resonator a piezoelectric vibration, and two output terminals, one of which derives a first electrical signal induced from said vibration, and the other of which derives a second electrical signal which opposite in phase to said first signal. A resistor circuit has a midpoint terminal which is supplied with a composite signal including a mixture of two distinct supressed-carrier modulated signals, and two end terminals, connected across the resonator output terminals at each of which is produced a balanced signal of said composite signal. A detector has two input terminals connected to the resistor circuit end terminals one of which receives the partially demodulated first signal which is a mixture of said balanced signals and said first signal, and another of which receives the partially demodulated second signal which is a mixture of said balanced signals and said second signal, two output terminals, at one of which is produced a single distinct signal detected from said partially demodulated first signal and at the other of which is produced a single distinct signal detected from said partially demodulated second signal. Said piezoelectric ceramic resonator is a thin rectangular plate and has a resonance vibration at the frequency of said subcarrier signal.

3,609,559

COAXIAL MICROWAVE MODULATOR

James Gifford Evans, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed June 18, 1970, Ser. No. 47,246
Int. Cl. H04b *1/26*
U.S. Cl. 325—449 **5 Claims**



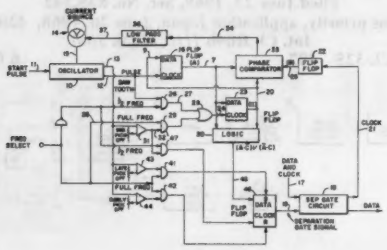
A microwave modulator is disclosed which takes the form of a microwave transmission line segment having a pair of

diametrically opposed longitudinal slots cut in its outer conducting sheath. Nonlinear impedance means are positioned in the sheath and connected to the sheath at two points each of which is equidistant from all four slot extremities. Modulating waves applied across the nonlinear impedance means modulate microwaves traversing the segment.

3,609,560
DATA SEPARATION CIRCUIT FOR MAGNETIC RECORDER MEMORIES

Michael P. Greenberg, Winchester, Mass., assignor to Bedford Associates, Inc., Bedford, Mass.

Filed Jan. 9, 1970, Ser. No. 1,808
Int. Cl. H03k *1/00, 3/04*
U.S. Cl. 328—63 **15 Claims**



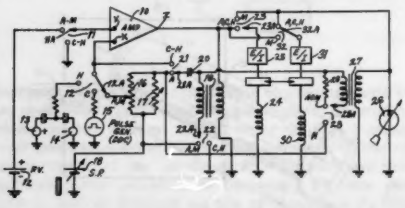
A data separation circuit providing an output separation gate signal having a frequency proportional to the average frequency of the input clock pulse signals that are recorded on a magnetic rotating memory disc. The clock pulse signals are then readily separated from data pulse signals in the recorded signal even though the exact position in time of each pulse has been altered by the recording process. The data separation circuit comprises simple, easily assembled circuitry that tracks recording frequencies read from two types of magnetic rotating memory drives, one of which records at twice the frequency of the other. A major component of the data separation circuit is a frequency controllable oscillator that simultaneously produces a sawtooth wave and a clock pulse. The oscillator clock pulse rate is compared with the input recorded clock pulse rate and the comparator output is used to control the oscillator's frequency rate.

The separation gate signal is initiated and terminated when the frequency controlled sawtooth wave attains predetermined levels. Similarly, the attainment of a predetermined level by the sawtooth wave is used in generating the feedback signal to the oscillator when operating with a high frequency memory drive. Expensive and complicated high frequency pulse logic circuits are therefore not required.

3,609,561
ELECTRONIC PROCESS CONTROLLER WITH SINGLE DIFFERENTIAL AMPLIFIER RESPONSIVE TO EITHER ANALOG OR DIGITAL SIGNALS

Hubert A. Riester, Huntington Valley, Pa., assignor to Fischer & Porter Company, Warminster, Pa.

Filed Feb. 26, 1970, Ser. No. 14,489
Int. Cl. H03k *17/00*
U.S. Cl. 328—69 **7 Claims**

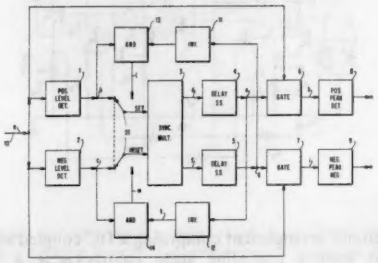


An electronic controller which is responsive to either analog or digital signals to operate a final control element in a process control loop, the controller acting in conjunction with other devices to maintain a process variable at a desired value. The controller includes a single amplifier adapted to function in conjunction with an appropriate feedback network to create an interface between a direct digital control system and to afford supplemental switching to effect either digital control, automatic analog control or manual control of the final control element.

3,609,562
SYNCHRONIZED DEMODULATOR

Peter J. Granata, Campbell, and Francis E. Mueller, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 17, 1970, Ser. No. 55,792
Int. Cl. H03d *3/18*
U.S. Cl. 329—50 **10 Claims**

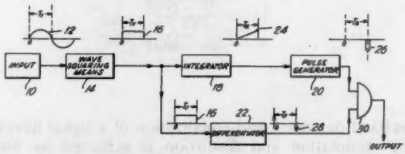


This invention relates to a demodulator used in a servo-positioning system which is maintained in synchronization both during the track-seeking mode and the fine-positioning mode of operation of the servosystem. The demodulator monitors signals received from the servoed medium and obtains from this signal, positioning information between the servoed means and the servoing apparatus, while obtaining synchronization information from the same received signals. The demodulator is comprised of a positive level detector, a negative level detector, a synchronizable free-running multivibrator, delayed single shots, gates, a positive peak detector and a negative peak detector. A means for including a noise rejection means into the demodulator is also shown.

3,609,563
FREQUENCY DETECTOR

Leon Zinn, Syossit, N.Y., and Milton Bodin, Teaneck, N.J., assignors to Coditron Corporation, New York, N.Y.

Filed Nov. 12, 1968, Ser. No. 775,025
Int. Cl. H03d *3/04;* **H03k** *5/20*
U.S. Cl. 329—126 **5 Claims**



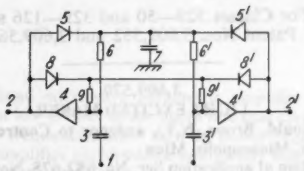
A frequency detector adapted to produce an output signal when a first intermediate signal produced by a first circuit means in response to an input signal at a time representative of the period of the desired frequency, is in time coincidence with a second intermediate signal produced by a second cir-

cuit means in response to said input signal at a time representative of the period of the frequency of said input signal.

3,609,564
COMPARISON CIRCUIT FOR ALTERNATING VOLTAGES

Karoly Galyas, Johanneschov; Benjamin Trok, Johanneshov, and Erik Lennart Skogsberg, Huddinge, all of Sweden, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 1, 1969, Ser. No. 862,843
Claims priority, application Sweden, Oct. 4, 1968, 13411/1968
Int. Cl. H03k 5/20
U.S. Cl. 328—147 5 Claims

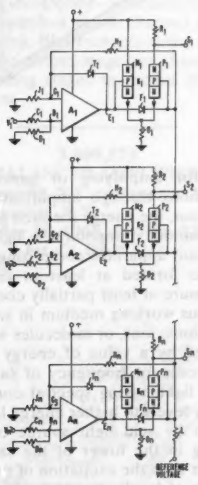


A circuit is provided for comparing alternating voltages without first rectifying them. In this circuit a capacitor and an amplifier circuit having high amplification are connected in series between each input and output terminal of the circuit, with a feedback circuit consisting of a diode device and a resistor being connected in parallel to each amplifier circuit and with the junction points of the diode devices and the resistors of the two feedback circuits being interconnected. In this manner a common threshold voltage will be achieved at the inputs of the amplifier circuits and thus, an output voltage only on the output terminal whose corresponding input terminal has been supplied with a higher input voltage.

3,609,565
EXTREME LEVEL DETECTOR

Robert W. Arnold, Hopewell, Va., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,581
Int. Cl. H03k 5/20
U.S. Cl. 328—147 10 Claims

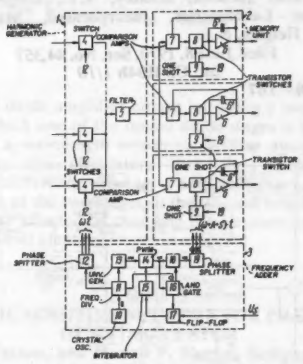


A system for identifying and selecting the maximum or minimum value signal from among a plurality of signals. The system includes an amplifier for each input signal. The outputs of the amplifiers are connected to a common load through individual diodes. A negative feedback connection is provided from the load to an amplifier input. The polarity of the voltage drop across the diodes is monitored to determine the diode which is forward biased. This indicates the amplifier with the extreme valued input signal. A second set of diodes across the amplifiers limits the output voltage to reduce overload conditions.

3,609,566
DEVICE FOR TRANSFORMATION OF VOLTAGE COORDINATES IN SIMULATION OF TRANSIENTS IN COMPLEX POWER SYSTEMS

Georgy Vasilievich Roschin, ploschad Revoljutii 3, kv. 55, Istra Moskovskoi Oblasti, U.S.S.R.

Filed Mar. 5, 1969, Ser. No. 804,404
Int. Cl. H03b 3/00
U.S. Cl. 328—155 3 Claims

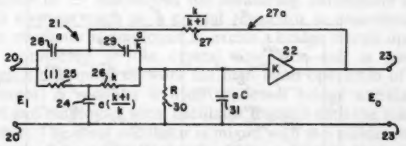


A device for electronic analogue simulation of transients in complex power systems and for transformation of voltage coordinates including the combination of a harmonic converter, memory units and a frequency adder. In checking transients in power systems, harmonic converter includes selective filter connected to the input of the analogue memory unit through a current detector or operational amplifiers with passive networks in their feedback loops.

3,609,567
RC NETWORKS AND AMPLIFIERS EMPLOYING THE SAME

James F. Webb, Administrator of the National Aeronautics and Space Administration with respect to an invention of; William J. Kerwin, and Lawrence P. Huelsman, Tucson, Ariz.

Continuation of application Ser. No. 624,611, Mar. 20, 1967, now abandoned. This application Apr. 17, 1970, Ser. No. 28,235
Int. Cl. H03f 1/00
U.S. Cl. 328—167 19 Claims

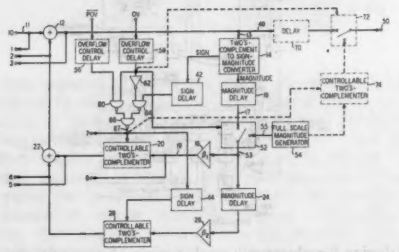


The active filter circuit of the present invention comprises a passive RC network and a DC voltage or operational amplifier. The resistive and capacitive elements of the passive RC network determine the location of a pair of complex conjugate zeros along the $j\omega$ axis. Connected to the RC network in shunt are a load resistor and a load capacitor. A feedback network interconnects the output of the voltage amplifier with the passive RC network. By regulating the value of the

load resistor and the value of the load capacitor jointly or severally, the location of a pair of complex conjugate poles produced by the active filter can be adjusted separately and independently from the zeros. In addition thereto, the regulation of the gain of the DC voltage or operational amplifier or the changing of the feedback voltage of the DC voltage or operational amplifier adjusts independently the location of the pair of complex conjugate poles relative to the zeros.

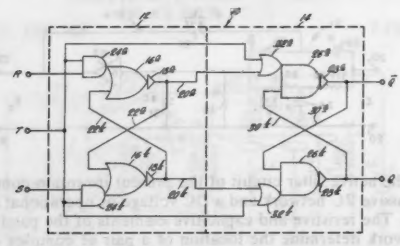
When a plurality of active filter circuits are connected in cascade, a frequency-selective amplifier is formed with the DC voltage or operational amplifiers serving additionally as isolation devices between successive active filter circuits. It is to be observed that each active filter circuit produces real frequency zeros of transmission at any desired frequency independently of the location of complex poles with respect to the zeros.

3,609,568
STABLE DIGITAL FILTER APPARATUS
Leland Brooks Jackson, Monsey, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed June 8, 1970, Ser. No. 44,357
Int. Cl. H04b *1/10*
U.S. Cl. 328—167 **17 Claims**



In a digital filter, arithmetic overflows are detected and their kind (whether positive or negative) determined by logical manipulation of the signs of the numeric quantities entering and leaving each arithmetic component of the filter. If net positive or negative overflow is detected, the final result of the filter operation is replaced by a positive or negative full scale numeric quantity, respectively, thereby preventing instability in the filter and suppressing output signal transients.

3,609,569
LOGIC SYSTEM
Ronald C. Todd, Somerville, N.J., assignor to Solid State Scientific Devices Corporation, Montgomeryville, Pa.
Filed July 9, 1970, Ser. No. 53,395
Int. Cl. H03k *3/26*
U.S. Cl. 328—201 **13 Claims**

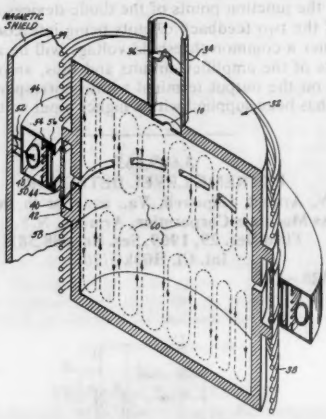


A single-phase master/slave flip-flop circuit combines a pair of flip-flop networks which are mathematical duals. Each network includes a pair of gates connected in flip-flop arrangement with the inverted output of each providing the network outputs and being fed back as an input to the other gate in the flip-flop pair. The flip-flop gates in one network are AND gates and one input of each is an OR gate. This sequence of gates is reversed in the other network. It is possible to have the networks arranged in either order. Each input gate receives as an input a signal common to all four input gates and at least one other input signal. Other input signals to the input gates of one network are the output signals of the other network. The network outputs of said one network provide system outputs. Input signals to the input gates of the other network are system inputs. This circuit is applicable to RST, D, T, JK, flip-flop circuits and modifications thereof.

ERRATA

For Classes 329—50 and 329—126 see:
Patent Nos. 3,609,562 and 3,609,563

3,609,570
LIGHT EXCITED MASER
Gordon Gould, Bronx, N.Y., assignor to Control Data Corporation, Minneapolis, Minn.
Continuation of application Ser. No. 682,678, Nov. 13, 1967, now abandoned , Continuation of application Ser. No. 837,471, Sept. 1, 1959, now abandoned. This application June 17, 1968, Ser. No. 751,017
Int. Cl. H01s *3/09, 3/16*
U.S. Cl. 330—4.3 **18 Claims**

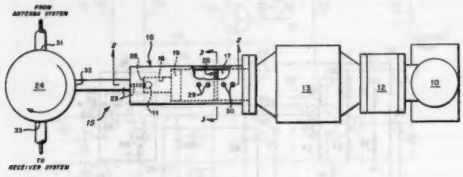


1. Apparatus for amplifying or generating microwave frequency oscillations through amplification by stimulated emission of radiation, the energy for such amplification being supplied by substantially unpolarized light or nonuniform spectral density, said apparatus comprising a radiofrequency resonant structure formed at least in part of conductive material, an enclosure at least partially coextensive with said structure, a gaseous working medium in said enclosure, said medium having atoms, ions, or molecules with a pair of energy levels separated by a value of energy substantially corresponding to a resonant frequency of said resonant structure, a source of light having spectral components exciting said pair of energy levels to higher energy levels, means causing the excitation by said light source of atoms, ions, or molecules existing in the lower of the said pair of energy levels to be greater than the excitation of those existing at the higher of said pair of levels, means for ingress of light from said source into said enclosure and means for transmitting radiofrequency energy from said resonant structure to an exterior point of utilization.

3,609,571
SIDEBAND SUPPRESSION FOR BROADBAND PARAMETRIC AMPLIFIER

Gerald Ira Klein, Westbury, N.Y., and Robert L. Zahm, Annapolis, Md.

Filed Oct. 27, 1969, Ser. No. 869,526
Int. Cl. H03f 7/04
U.S. Cl. 330—4.9 6 Claims

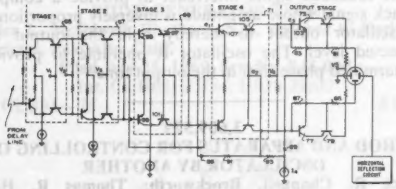


A broadband microwave parametric amplifier utilizing a resonant slot low Q filter in the pump line that creates a short circuit at all frequencies other than the pump frequency. This makes the amplifier performance completely independent of pump line source impedance.

3,609,572
SIGNALLING CIRCUIT

Alan J. De Vilbis, Colorado Springs, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed July 2, 1969, Ser. No. 838,532
Int. Cl. H03j 3/68
U.S. Cl. 330—30 2 Claims

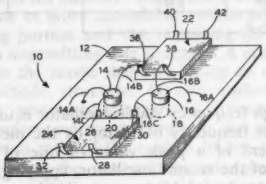


A signal circuit for an oscilloscope includes iterative gain stages and signal-controlled attenuators which may be operated as gain verniers or as channel switches for multiplexed signal mixing. Bias currents in the active elements of gain stages near the output stage are shared with the active elements of preceding stages to reduce the total quiescent current requirement.

3,609,573
BALANCED AMPLIFIER

Hugh A. Hair, Liverpool, N.Y., assignor to Anaren Microwave Incorporated, Syracuse, N.Y.

Filed May 26, 1969, Ser. No. 827,832
Int. Cl. H03f 3/14
U.S. Cl. 330—38 M 6 Claims

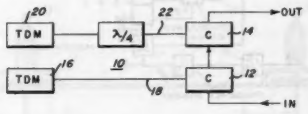


A balanced transistor amplifier is disposed on a slab of electrically and thermally conductive material. Two transistors are fixed in thermal contact with the slab. A 3 db. quadrature coupler feeds a signal from a common input to both transistors. A second 3 db. quadrature coupler feeds the amplified signals from both transistors to a common output.

3,609,574
TUNNEL DIODE AMPLIFIER

Robert G. Geissler, Cranford, N.J., assignor to Raytheon Company, Lexington, Mass.

Continuation of application Ser. No. 717,668, Apr. 1, 1968, now abandoned. This application May 26, 1970, Ser. No. 41,699
Int. Cl. H03f 15/00
U.S. Cl. 330—61 A 7 Claims

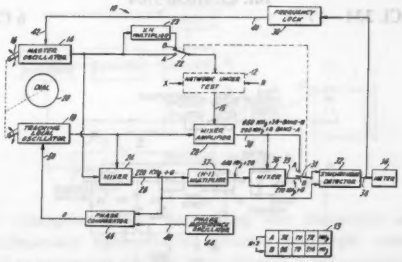


A tunnel diode amplifier circuit including a two-stage amplifier in which one of the tunnel diode stages is located one quarter of a wavelength nearer or further away from the transmission line circulators than the other. This ¼ wavelength difference provides a complementary effect with temperature of the two stages so that the net response is considerably less effected by changing temperature as compared with that of two identical stages in cascade.

3,609,575
HARMONIC SENSITIVE NETWORK FOR PHASE LOCK OF AN OSCILLATOR

Benjamin Parzen, and Russell F. Sherry, Bethpage, both of N.Y., assignors to Ovitron Corporation, Newburgh, N.Y.

Filed Mar. 3, 1970, Ser. No. 16,124
Int. Cl. G01r 29/22
U.S. Cl. 331—2 9 Claims

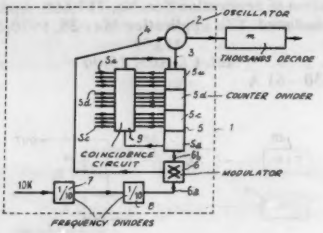


A method and apparatus expanding the operational frequency of an instrument for measuring parameters of a circuit element such as a crystal resonator is described. A master oscillator is employed to excite a bridge circuit operatively connected to the crystal resonator and is passed through a multiplier network for high band operation of the instrument. A receiver is used to detect bridge unbalance output and employs a local oscillator tracked with the master oscillator. The local oscillator is mixed with the master oscillator to produce a first IF signal and is mixed with the output of the bridge to produce a second IF signal. A selected multiple of the first IF signal is then produced for use in the high band operation of the instrument and mixed with the second IF signal to provide a low noise IF signal representative of bridge unbalance. Synchronous detection of the low-noise IF signal provides a signal for frequency lock of the master oscillator for minimum bridge unbalance while the local oscillator is phase locked to a reference stable frequency source.

3,609,576
FREQUENCY SYNTHETIZER

Roger Charbonnier, Meudon, France, assignor to Adret Electronique, Trappes (Yvelines), France

Filed May 14, 1969, Ser. No. 824,636
Claims priority, application France, June 18, 1968, 155,393
Int. Cl. H03b 3/04
U.S. Cl. 331—2 6 Claims



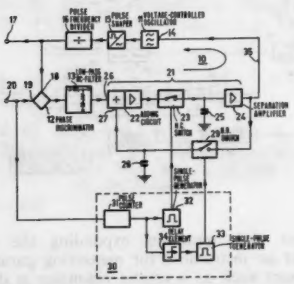
The invention broadly relates to frequency synthetizers including a plurality of decades, each of which receives an input frequency Fo+A originating from the preceding decade and provides an output frequency Fo+A/10+B, Fo being a fixed frequency and A and B being frequency increments varying by integral steps.

More specifically, the instant invention provides a frequency synthetizer of simplified construction wherein the group formed by the head decades essentially consists of a single oscillator cooperating with means for varying its frequency so as to obtain, without any beat with an intermediate frequency and without any injection of a carrier frequency, the variable frequency Fo+A to be applied to the following decades.

3,609,577
FREQUENCY CONTROL-ARRANGEMENT

Marinus Anton Bos, Rockville, Md., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1969, Ser. No. 872,248
Int. Cl. H03b 3/04
U.S. Cl. 331—17 6 Claims

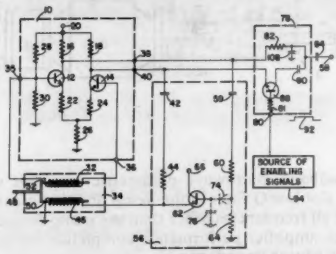


A frequency control-arrangement for stabilizing the frequency of an oscillator having a controllable frequency on the frequency of a control-signal, in which a phase discriminator receives the control-signal and a comparison signal derived from the oscillator, said oscillator having a frequency control-input. A transmission path connects the phase discriminator to the frequency control-input of the oscillator. The frequency control-arrangement include a storage element, storage control means for storing a voltage derived from the output side of the transmission path in the storage element and means for feeding back a voltage derived from the storage element to the input side of the transmission path.

3,609,578
OSCILLATOR HAVING FEEDBACK AMPLITUDE CONTROL AND SWITCHABLE OUTPUT PHASE SHIFTER

Ronald H. Chapman, Wheaton, and James J. Michalik, Hoffman Estates, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 18, 1970, Ser. No. 20,625
Int. Cl. H03b 3/02, 5/30, 27/00
U.S. Cl. 331—45 13 Claims

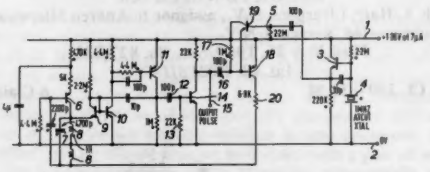


An oscillator circuit for providing a constant amplitude output tone includes a differential amplifier and a frequency-selective, feedback network. A regulating circuit is connected from an oscillator output to the feedback network, and as the output of the oscillator exceeds a predetermined threshold, the regulating circuit develops a regulating signal which is proportional to the amplitude of the output and opposite phase to the feedback signal. This regulating signal and the feedback signal interreact to provide a composite feedback signal whose amplitude is inversely proportional to the oscillator output to thereby hold the output at a preselected level. The oscillator is operable to provide a predetermined phase shift in the output tone.

3,609,579
METHOD AND APPARATUS FOR CONTROLLING ONE OSCILLATOR BY ANOTHER

Terence R. Chappell, Brockworth; Thomas R. Heeks, Woodmancote, Cheltenham; Michael J. Rogers, Cheltenham, and John H. Shelley, Eastcombe, near Stroud, all of England, assignors to Smiths Industries Limited, London, England

Filed May 26, 1969, Ser. No. 827,662
Claims priority, application Great Britain, May 31, 1968, 26118/68
Int. Cl. H03b 3/04
U.S. Cl. 331—46 12 Claims



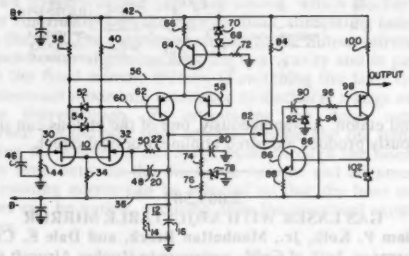
A first high frequency stable oscillator is used to control a second lower frequency oscillator by the method of sensing the attainment of a peak value of one of the oscillating parameters of the second oscillator, applying a constraint to that parameter to inhibit temporarily the oscillation of the second oscillator, and releasing the constraint when the first oscillator next reaches a datum position in its cycle of oscillation.

3,609,580

ELECTRICAL SENSING APPARATUS

Francis T. Thompson, Murrysville, and Bruce R. Dow, Delmont, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 14, 1969, Ser. No. 876,774
Int. Cl. G01r *33/12*
U.S. Cl. 331—65 11 Claims



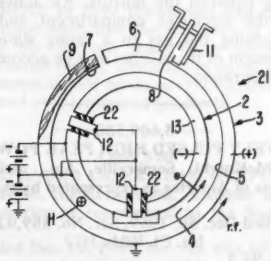
Electrical sensing apparatus such as proximity detectors and vibration pickups of the type in which the instantaneous displacement between an inductor in the tank circuit of an oscillator and a conductive object in the field of the inductor is reflected in the output amplitude of the oscillator as a function of the "Q" of the tank circuit. The oscillator incorporates a low frequency, essentially direct current negative feedback path which, in conjunction with high loop gain at oscillation frequencies, insures that the circuit will oscillate under low "Q" conditions when the inductor is closely adjacent a conductive object.

3,609,581

LOW POWER REENTRANT STREAM CROSSED-FIELD NOISE GENERATOR TUBE

Hunter L. McDowell, Chatham, N.J., assignor to Varian Associates, Palo Alto, Calif.

Filed July 25, 1969, Ser. No. 845,000
Int. Cl. H01j *25/34*; H03b *29/00*
U.S. Cl. 331—78 5 Claims



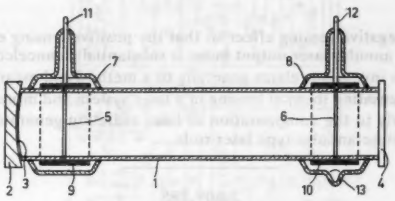
A crossed-field reentrant stream noise generator tube is disclosed. The tube is of the circular crossed-field geometry having a cathode electrode structure coaxially disposed of an anode electrode structure to define an unobstructed crossed-field interaction region in the space between the anode and cathode such that the electron stream can circulate completely around the cathode. The cathode electrode structure includes one or more thermionic emitter buttons forming the emitting portion and the remaining portion of the cathode forms a nonemitting sole structure. A microwave circuit is formed in the anode structure facing an arcuate portion of the cathode structure. In one embodiment, the nonemitting sole portion of the cathode structure is treated to inhibit secondary emission therefrom by reducing the secondary emission ratio of the surface to less than 1. In a second embodiment, the nonemitting sole portion of the cathode structure is biased negatively relative to the thermionic emitter to prevent bombardment of the sole and thus to inhibit secondary emission therefrom.

3,609,582

DEVICE FOR PRODUCING STIMULATED INFRARED EMISSION, IRASER, BY MEANS OF AN ELECTRIC DISCHARGE IN A GAS MIXTURE CONSISTING AT LEAST PARTLY OF CARBONIC ACID AND DISCHARGE TUBE FOR SUCH A DEVICE

Henricus Joannes Franciscus Gerardus Smets, and Auke Gerrit van der Kooi, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Feb. 14, 1969, Ser. No. 799,384
Claims priority, application Netherlands, Feb. 19, 1968, 6802368
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 5 Claims



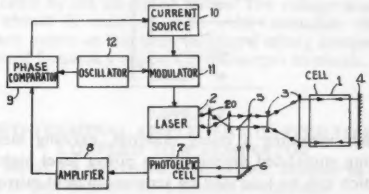
An infrared laser employing a discharge in carbonic acid gas in a quartz tube, the electrodes consisting of platinum cylinders surrounding interruptions in the quartz tube.

3,609,583

ARRANGEMENT FOR CONTROLLING THE FREQUENCY OF A LIGHT SOURCE USING AN ABSORPTION CELL

Henri Brun, Paris, France, assignor to Thomson-CSF

Filed Aug. 13, 1969, Ser. No. 849,834
Claims priority, application France, Sept. 30, 1968, 168,196
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 4 Claims



An arrangement for controlling the frequency of a monochromatic light source, wherein said light wave is caused to propagate out and back through a cell containing a gas or a vapor having an absorption line and wherein the light wave is frequency modulated and feedback loop, between the frequency-controlling means of the light source and an output collecting the wave reflected through the said cell, is provided for monitoring the frequency of said light source.

3,609,584

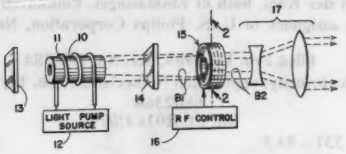
METHOD AND MEANS FOR COMPENSATING THERMAL LENSING IN A LASER SYSTEM

Malcolm L. Stitch, and Walter Koechner, both of Malibu, Calif., assignors to Union Carbide Corporation, New York, N.Y.

Filed Feb. 11, 1970, Ser. No. 10,401
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 7 Claims

A negative thermal circular lens is provided for compensating the thermal lensing effect inherent in output radiation

generated by a solid-state laser rod of the annular configuration. The compensating thermal lens is of annular construction with metallic coatings on its inner and outer cylindrical surfaces. These coatings are heated by RF energy to develop a thermal gradient in the direction to induce stress resulting



in a negative lensing effect so that the positive lensing effect in the annular laser output beam is substantially canceled.

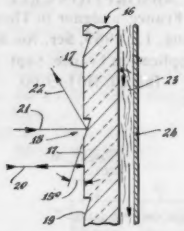
This invention relates generally to a method and means for compensating thermal lensing in a laser system and more particularly to the compensation of laser radiation generated by solid-state-annular-type laser rods.

3,609,585

HIGH-POWER LASER INCLUDING MEANS FOR PROVIDING POWER OUTPUT

Robert E. Hufnagel, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Oct. 15, 1968, Ser. No. 767,787
Int. Cl. H01s *3/08*
U.S. Cl. 331—94.5 **13 Claims**



A laser including a lasing material, exciting means for producing stimulated emission at a power level higher than that which can be tolerated by semitransparent mirrors, and a pair of opaque reflective mirrors defining a resonant optical cavity. The surface of at least one of the mirrors includes a plurality of periodic fluctuations, preferably comprising grooves, separated by flat regions so that the major proportion of an incident beam coaxial with the cavity is reflected back upon itself and a proportion of the incident beam sufficient to provide a useful power output is diffractively reflected to an angle to the axis of the cavity.

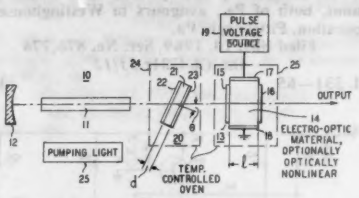
3,609,586

LASER WITH PULSED TRANSMISSION MODE Q-SWITCHING

Hans G. Danielmeyer, Matawan, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed June 18, 1969, Ser. No. 834,328
Int. Cl. H01s *3/11*
U.S. Cl. 331—94.5 **4 Claims**

A Q-switched solid state laser in which the pulse is dumped from the resonator is disclosed. The laser employs a first resonant etalon for selection of a single axial mode and a second electro-optic resonant etalon for the Q-switching and pulse dumping. The second etalon is employed as the output reflector of the resonator. Cooperation of the two etalons enables switching of the resonator condition with exceptionally small voltage and risetime requirements to drive the



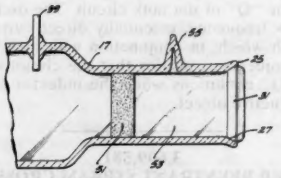
second etalon. Advantageously, one of the etalons can simultaneously produce a desired nonlinear optical effect.

3,609,587

GAS LASER WITH ADJUSTABLE MIRROR

William P. Kolb, Jr., Manhattan Beach, and Dale E. Crane, Torrance, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 27, 1969, Ser. No. 869,632
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **1 Claim**



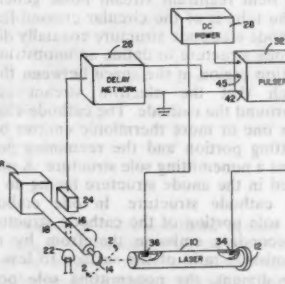
A gas laser having an elongated plasma tube with a fixed mirror at one end and an adjustable mirror at the other end. An isolation element such as a Brewster window is disposed in the plasma tube near the adjustable mirror to create a gastight discharge compartment between itself and the fixed mirror while maintaining the regenerative path defined by and extending between the mirrors. An active laser gas is disposed in the discharge compartment and appropriate means for exciting the gas to a lasing state is provided whereby alignment of the mirrors may be accomplished while the laser is in operation.

3,609,588

REPETITIVELY PULSED HIGH PEAK POWER LASER

William B. McKnight, Somerville, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed Dec. 30, 1969, Ser. No. 889,021
Int. Cl. H01s *3/11*
U.S. Cl. 331—94.5 **2 Claims**



A high peak power laser is repetitively pulsed by a delay circuit that is synchronized with a Q-switching circuit to pro-

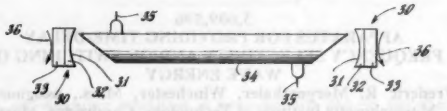
vide maximum power output pulses. The laser medium has a fixed reflective mirror at one end of the cavity and a partially reflective output mirror rotating on a shaft at the other end thereof. A hole drilled through the diameter of the shaft has a light source and a photocell at opposite ends thereof. Light passes through the hole and activates the photocell once during each half cycle of shaft rotation. In response to the periodic light beam, the photocell produces an electrical pulse which is coupled to a variable delay circuit. The delay circuit triggers a laser pumping circuit, which discharges a large current through the laser medium, stimulating lasing action therein. The rotating shaft brings the output mirror into perpendicular alignment with the laser cavity and in parallel with the fixed mirror, thereby Q-switching the laser from a nonresonant mode into resonance to discharge a large energy pulse therethrough. By introducing the delay network between the periodic light reference pulse and the signal initiating the electrical discharge pulse through the laser, the delay time between the discharge current and alignment of the rotating mirror can be selected so that the laser output pulses can be varied, occuring after the electrical excitation pulses.

3,609,589

MIRROR FOR RESISTING THERMALLY INDUCED WARP

Robert E. Hufnagel, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 3, 1968, Ser. No. 756,855
Int. Cl. H01s *3/04*
U.S. Cl. 331—94.5 **9 Claims**



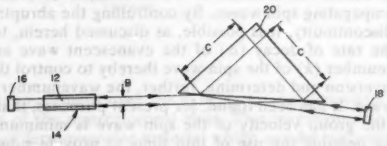
A mirror for use in conditions which produce a severe thermal gradient including a first layer having a reflecting surface of selected configuration and one or more additional layers bonded to the back of the first layer. The various layers are selected to have thicknesses and coefficients of thermal expansion such that the tendency of the mirror to warp due to the thermal gradient is opposed by, and preferably balanced by, the tendency to curve caused by differential expansion of said layers so that the selected configuration is retained over a range of gradients.

3,609,590

EXPANDED LASER BEAM OUTPUT

James L. Jernigan, Inyokern, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Dec. 11, 1969, Ser. No. 884,093
Int. Cl. H01s *3/08*
U.S. Cl. 331—94.5 **4 Claims**



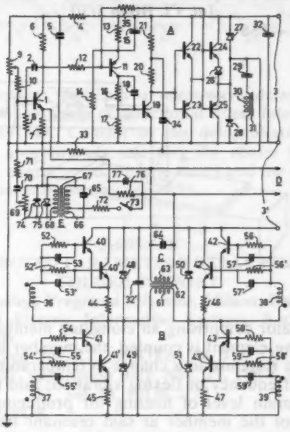
A laser utilizing two 100 percent reflective surfaces and a prism positioned in the laser cavity between the reflective surfaces. A majority of the beam is reflected off one side of the prism and directed to a reflective surface where it reflects toward the prism while the rest of the beam is transmitted through the prism to form an elliptical output beam.

3,609,591

PULSE GENERATOR WIDTH MODULATED BY ITS FILTERED OUTPUT FOR PRODUCING SINUSOIDAL OUTPUT

Gerrit Hendrik Van Hensbergen, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 16, 1969, Ser. No. 858,443
Claims priority, application Netherlands, Sept. 17, 1968, 6813243
Int. Cl. H03b *3/02, 5/12*
U.S. Cl. 331—108 B **8 Claims**



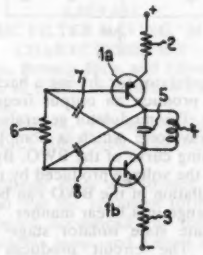
An electronic arrangement for generating an alternating current comprising a pulse generator having a fixed frequency which is high compared with the frequency of the alternating current to be generated, a switching amplifier by which the pulses generated by this generator are amplified, a low-pass filter by way of which the alternating current generated can be supplied to the output terminals, and a circuit tuned to the frequency of the alternating current to be generated and excited by the amplified pulses. The voltage across this tuned circuit is used to pulse-width modulate the high frequency pulses so that after buildup a strong component at the desired frequency appears at the output terminals.

3,609,592

TWO-TERMINAL AMPLIFIER ADAPTED TO BE COUPLED TO A RESONATOR

Gaston Raval, La Neuveville, Switzerland, assignor to Omega Louis Brandt & Frere S.A., Bienne, Switzerland

Filed June 1 1, 1969, Ser. No. 832,148
Claims priority, application Switzerland, June 19, 1968, 9132/68
Int. Cl. H03b *5/30*
U.S. Cl. 331—116 **12 Claims**



A two-terminal amplifier adapted to be connected to a resonator, the amplifier of simple and small design, particu-

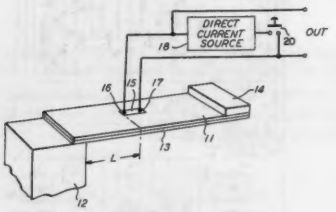
larly for use in timepieces, having two complementary transistors series-connected and a single coil coupled with a resonator and connected between the collectors of said transistors.

3,609,593

VIBRATORY REED DEVICE

Harry J. Boll, Berkeley Heights, and Martin P. Lepselter, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 25, 1966, Ser. No. 552,955
Int. Cl. H03b *5/30*
U.S. Cl. 331—156 **8 Claims**



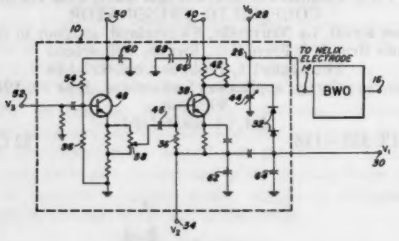
An oscillator comprising an elongated member to which a piezoresistive element is coupled, the member being capable of flexing in response to a change in temperature and having a resonant frequency of flexing vibration, said member having a minimum level of heating for producing continuous oscillation of the member at said resonant frequency, and direct current means for heating said member in response to the direct current applied to the piezoresistive element appropriate for supplying said minimum level of heating of the member and thereby to produce said oscillation of the member.

3,609,594

SOLID-STATE BACKWARD WAVE OSCILLATOR MODULATOR

Murray H. Mott, and Donald B. Kavanagh, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Nov. 24, 1969, Ser. No. 879,471
Int. Cl. H03c *1/28*
U.S. Cl. 332—7 **2 Claims**



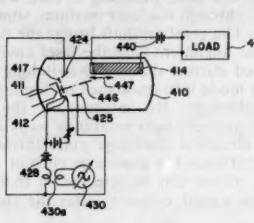
A solid-state modulator for driving a backward wave oscillator (BWO) to produce an output frequency that varies linearly with time. The modulator generates a voltage having an exponential waveform which is complementary to, i.e., matches, the turning curve of the BWO. By driving the helix of the BWO with the voltage produced by the modulator, the frequency of oscillation of the BWO can be swept through a wide frequency range in a linear manner. The modulator includes a solid-state state isolator stage and a solid-state switching stage. The circuit produces the exponential waveform by charging a capacitance during the on-time of the solid-state stages and by discharging the capacitance through an RC circuit during the off-time of the solid-state stages.

3,609,595

BEAM-CONTROL SEMICONDUCTOR OSCILLATOR

Kiyoshi Inoue, 100 Sakato, Kawasaki, Kanagawa, Tokyo, Japan

Filed Dec. 22, 1966, Ser. No. 603,971
Claims priority, application Japan, May 12, 1966, June 11, 1966, 41/30181;41/37634
Int. Cl. H01j *31/58;* **H03c** *3/34;* **H03b** *5/12*
U.S. Cl. 332—25 **5 Claims**



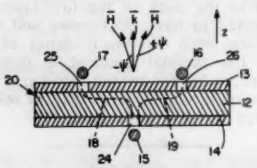
An electron beam high frequency generator and circuit arrangement in which a pencil of electrons (i.e., an electron beam) is trained at an acute angle against an elongated semiconductor bar in series with a current source and an electrode. A pair of deflector plates flank the beam to provide static or varying spreading of the latter while a grid permits control of the beam current and, therefore, the frequency of the device. By applying varying potential to the deflector plates, a modulation is superimposed upon the carrier frequency.

3,609,596

APPARATUS FOR PROVIDING TIME-DELAY FREQUENCY SELECTIVITY AND/OR SWITCHING OF WAVE ENERGY

Frederic R. Morgenthaler, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed June 27, 1968, Ser. No. 740,751
Int. Cl. H01p *5/12*
U.S. Cl. 333—7 **9 Claims**



Apparatus for providing time delay, frequency selectivity and/or switching of electromagnetic wave energy, that includes, a single- or multilayer magnetic material adapted, when magnetized, to convert electromagnetic wave energy in air, for example, to spin wave energy in the material, the electromagnetic wave energy being subjected to an abrupt discontinuity in the equilibrium environmental parameters to effect such conversion. The electromagnetic wave is converted within the material to a combination of evanescent and propagating spin waves. By controlling the abruptness of said discontinuity, it is possible, as discussed herein, to control the rate of decay (α) of the evanescent wave and the wave number (k) of the spin wave thereby to control the rate of conversion and determine, further, the wavenumber of the spin wave. It has been found, for present purposes, that when $\alpha=k$, the group velocity of the spin wave is minimum, thus making possible the use of thin films to provide substantial delay.

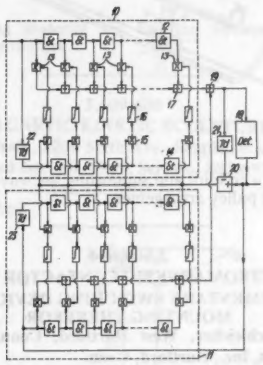
There is also described apparatus and method in which the power within the material can be directed at some angle to the direction of the incoming wave to provide some time delay but, more importantly, to provide switching and/or filtration of an input signal; the latter apparatus and method do not ordinarily relate to thin film although thin film may be used. Further, operation is generally in the region of $\alpha>>k$.

3,609,597

SELF-ADAPTIVE EQUALIZER FOR TIME-VARYING CHANNELS

Laurence Stanley Moye, Harlow, Essex, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 21, 1968, Ser. No. 791,832
Claims priority, application Great Britain, Dec. 7, 1967, 55743/67
Int. Cl. H04b 3/04
U.S. Cl. 333—18 3 Claims



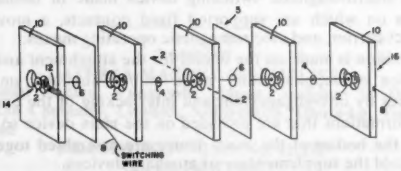
A self-adaptive equalizer is provided for use on switched telephone networks or other time-varying channels used for the transmission of digital signals. Continuous equalization of a time-varying channel is provided.

3,609,598

PERIODICALLY LOADED FERRITE PHASE SHIFTER

William G. Spaulding, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army

Filed Mar. 19, 1970, Ser. No. 20,967
Int. Cl. H01p 1/32
U.S. Cl. 333—24.1 4 Claims



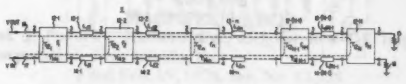
An improvement over the existing art in microwave phase shifters of the nonreciprocal class. This invention employs a toroid of ferromagnetic material which can be magnetized in at least two of its remanent states. Higher interaction with microwave energy is obtained when a periodic disturbance is introduced into the transmission line which slows the propagating wave and provides a higher degree of circular polarization in the active region of the toroid. Periodic perturbation of the electromagnetic field is accomplished by spacing partitions across the waveguide which are loaded with ferrite toroids. The dimensional spacing of the partitions is on the order of a fraction of a free-space wavelength.

3,609,599

TIME DELAY EQUALIZER UTILIZING A PLURALITY OF CASCADED DIRECTIONAL FILTERS

Robert Dean Standley, Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Mar. 18, 1970, Ser. No. 20,598
Int. Cl. H03h 7/14
U.S. Cl. 333—28 R 5 Claims



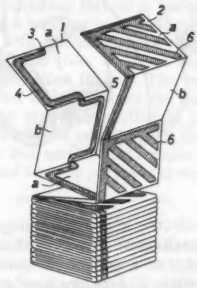
This application discloses a microwave delay equalizer which utilizes a cascade of directional filters interconnected by delay networks. Control of the delay characteristic is achieved by appropriately selecting the center frequencies and response characteristics of the filters and the delay times of the interconnecting delay networks.

3,609,600

DISTRIBUTED PARAMETERS DELAY LINE, ON FOLDED SUPPORT

Georges Kassabgi, Pregnana Milanese, Milano, Italy, assignor to General Electric Information Systems, S.p.A., Caluso (Torin), Italy

Filed Nov. 27, 1968, Ser. No. 779,428
Claims priority, application Italy, Nov. 27, 1967, 23,162A/67
Int. Cl. H03h 7/32
U.S. Cl. 333—31 R 14 Claims



A distributed parameter electromagnetic delay line is obtained by superimposing insulating thin foldable substrates carrying conductive patterns, which form, when folded in accordionlike fashion, a helicoidal winding composed of a plurality of turns interleaved with grounded conducting areas. As an alternate construction, a single insulating substrate carrying conductive patterns on both sides may be used.

3,609,601

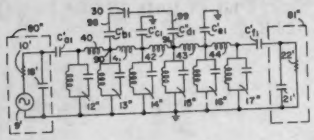
MONOLITHIC FILTER HAVING "M" DERIVED CHARACTERISTICS

Howard D. Phillips, Beverly Hills, and Edward M. Frymoyer, Santa Ana, both of Calif., assignors to Collins Radio Company, Dallas, Tex.

Filed Jan. 12, 1970, Ser. No. 2,208
Int. Cl. H03h 9/00, 9/20, 9/32
U.S. Cl. 333—72 8 Claims

A plurality electrode pairs are formed on a monolithic crystal substrate so that the resonator formed by each electrode pair is coupled acoustically to the next successive resonator, with suitable input and output transducer means associated with the first and last resonators. Discrete capacitor means connect the first electrodes of first and second pairs of electrodes to the second electrodes of said first and second pairs of electrodes. A bridging capacitor, having an order of magnitude of said first discrete capacitor means is

connected between said two first electrodes. A signal passing through this bridging capacitor is 180° out-of-phase with the signal passing through filter resonators at the upper and lower limits of the filter passband to produce attenuation poles at said upper and lower limits.

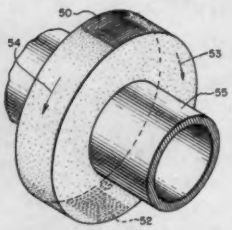


3,609,602

ACOUSTO-ELECTRIC SIGNAL TRANSLATION SYSTEM

Adrian J. De Vries, Elmhurst, and Fleming Dias, Chicago, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Mar. 4, 1968, Ser. No. 710,118
Int. Cl. H03h 9/00
U.S. Cl. 333—72 7 Claims



A body of piezoelectric material propagates acoustic surface waves. For launching or absorbing those waves, an electrode array is coupled to a surface portion of the body. The array includes a bifilar coil comprising a pair of windings coiled over the surface. A source or load is coupled between one end of one winding and the remote end of the other winding, with the remaining ends of both windings coupled together. The spacing between adjacent turns of the windings is effectively one-half the wavelength of the acoustic waves at the operating frequency. The bifilar winding is shown either in a form where it is coiled around a cylinder or where it is nested concentrically on a surface. In one species, an input transducer launches waves in two directions around a cylinder, and an output transducer absorbs waves coming from both of the two directions. The bifilar coil contributes an inductive reactance to compensate the clamped capacitance of the transducer.

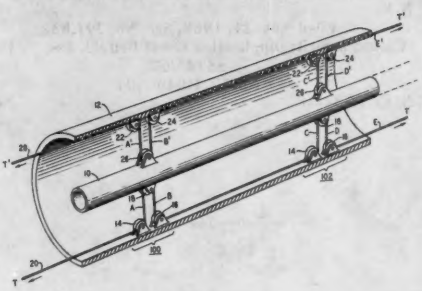
3,609,603

WAVEGUIDE SUPPORT SYSTEM USING CONSTANT TENSION CORD AND PULLEY ARRANGEMENTS

Milton Lutchansky, Randolph Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 27, 1970, Ser. No. 40,767
Int. Cl. H01p 3/12; F16l 7/00, 3/20
U.S. Cl. 333—95 6 Claims

The performance of waveguide transmission lines is critically dependent upon maintenance of proper alignment of the waveguide. Thus the waveguide must be isolated from vibrations, deformations and other disturbances in the surrounding terrain. This may be accomplished by placing the waveguide in a conduit and supporting the waveguide therein by a cord and pulley arrangement.

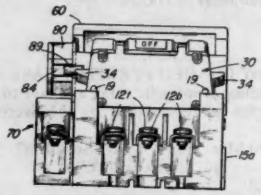


3,609,604

ELECTROMAGNETIC CONTACTOR WITH SUPPLEMENTARY SWITCHING DEVICES AND MOUNTING THEREFOR

Harold E. Schleicher, West Hartford, Conn., assignor to Arrow-Hart, Inc., Hartford, Conn.

Division of Ser. No. 704,363, Feb. 9, 1968, Pat. No. 3,551,859.
Filed June 17, 1970, Ser. No. 47,082
Int. Cl. H01h 45/02
U.S. Cl. 335—132 6 Claims



An electromagnetic switching device made of insulation bodies on which are supported fixed contacts, a movable contact carrier, and electromagnetic operating means.

Provision is made on the bodies for the attachment and annexation of supplementary poles and/or auxiliary smaller switches by interengagement and interlocking of the casings with formations that are provided on the main device so that when the bodies of the main device are assembled together they hold the supplementary or auxiliary devices.

3,609,605

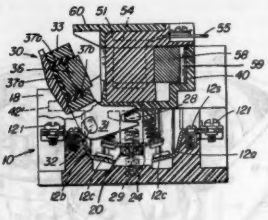
CUSHION MOUNTING FOR ARMATURE IN ELECTROMAGNETIC CONTACTOR

Harold E. Schleicher, West Hartford, Conn., assignor to Arrow-Hart, Inc., Hartford, Conn.

Division of Ser. No. 704,363, Feb. 9, 1968, Pat. No. 3,551,859.
Filed June 17, 1970, Ser. No. 46,845
Int. Cl. H01h 3/60
U.S. Cl. 335—193 6 Claims

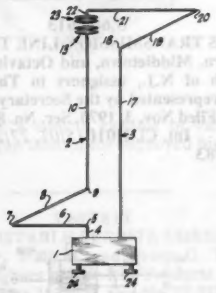
An electromagnetic switching device made of insulation bodies has a molded insulation armature which is apertured to receive a laminated armature having extensions overlying

the back edges of the aperture. A cover over the back of the aperture holds the armature in place. Cushions of resilient,



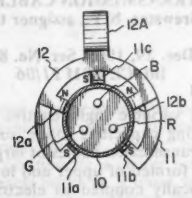
shock-absorbing material are inserted between the back cover and the armature.

3,609,606
MAGNETIC KINETIC SCULPTURE
William D. Podesto, 2200 Sixth Ave., Seattle, Wash.
Filed Dec. 10, 1969, Ser. No. 883,697
Int. Cl. H01f 7/00
U.S. Cl. 335—209 **5 Claims**



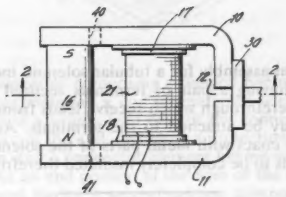
A magnetic kinetic amusement device and sculpture in which a pair of permanent magnets are separately supported by spring wires above a supporting base in spaced, substantially opposed relation with their corresponding poles adjacent each other, the supporting wires being shaped to enable universal random movement of the magnets relative to each other, and to support the magnets with their fields of force interlapping to effect prolonged random movement of the magnets due to repulsion of their corresponding poles when one magnet is forcibly moved relative to the other, and released.

3,609,607
LATERAL MAGNET ASSEMBLIES
Takeyoshi Sohma, Funabashi, Japan, assignor to Denki Onkyo Company, Limited, Nishirokuzo, Ohota-ku, Tokyo, Japan
Filed May 28, 1970, Ser. No. 41,470
Int. Cl. H01f 1/00
U.S. Cl. 335—212 **3 Claims**



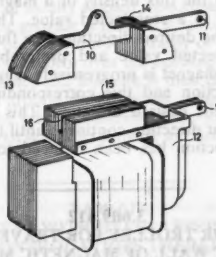
A lateral magnetic assembly adapted to be mounted on the neck of a color cathode-ray tube to adjust color electron beams is comprised by a first magnetic member having three equally spaced-apart radial projections, a second magnetic member having two radial projections each interposed between adjacent radial projections of the first magnetic members, inner ends of all radial projections terminating on a circle, a permanent magnet and clamping members formed on the first and second magnetic members to rotatably support the permanent magnet.

3,609,608
MAGNETIC LATCH
Frank J. Pokorny, Hatboro, Pa., assignor to I-T-E Imperial Corporation, Philadelphia, Pa.
Filed Feb. 19, 1970, Ser. No. 12,726
Int. Cl. H01f 7/04
U.S. Cl. 335—230 **10 Claims**



A magnetic latch for circuit interrupters in which a movable armature is attracted against pole faces in a magnetic structure by the circulating flux of a permanent magnet. A magnetic leg having a winding is magnetically in parallel with the armature and with the permanent magnet and is energized by energy derived from a circuit being protected, in response to fault conditions therein. The energization of the winding creates a flux which opposes the flux through the armature. A saturable magnetic section is provided between the coil and the permanent magnet such that the added flux of the coil saturates this section and creates a high-reluctance path between the coil and the permanent magnet path.

3,609,609
HIGH-SPEED ELECTROMAGNET
Piero Bertazzi, Caluso, Italy, assignor to General Electric Information Systems S.p.A., Caluso (Torino), Italy
Filed Mar. 5, 1969, Ser. No. 804,585
Claims priority, application Italy, Mar. 5, 1968, 828,353
Int. Cl. H01f 7/12
U.S. Cl. 335—249 **4 Claims**

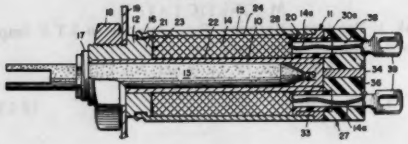


An electromagnetic structure including a movable armature and having additional airgaps provided in the magnetic loop so that the transit time from rest position to energized position is decreased.

3,609,610
SOLENOID TERMINAL ASSEMBLY

Robert W. Flentge, Roselle, Ill., assignor to Dormeyer Industries, Inc., Chicago, Ill.

Filed May 12, 1970, Ser. No. 36,564
Int. Cl. H01f 7/00; H01h 45/02, 45/04
U.S. Cl. 335—278 14 Claims

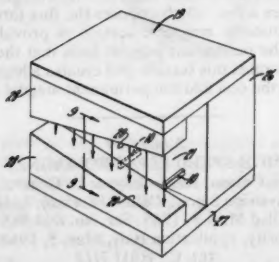


A terminal assembly for a tubular solenoid including a terminal cap having a pair of terminals secured thereto with openings therethrough which receive leads from the solenoid coil and may be attached to the terminals. An insulator is provided to coact with metal parts of the solenoid to enable the coil leads to be completely insulated therefrom.

3,609,611
METHOD AND APPARATUS FOR STABILIZING PERMANENT MAGNETS

Robert A. Parnell, 648 Washington St., Marengo, Ill.

Filed Sept. 26, 1969, Ser. No. 861,402
Int. Cl. H01f 13/00
U.S. Cl. 335—284 5 Claims



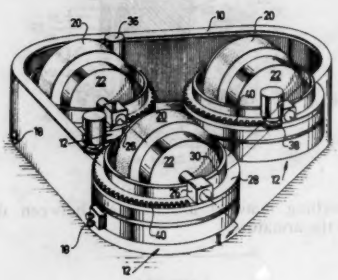
Method and apparatus for stabilizing permanent magnets, that is, reducing the flux density of a magnet in a predetermined direction to a preselected value. The magnet first is magnetized in the desired direction to a flux density greater than the preselected value and preferably to saturation. Thereafter, the magnet is progressively magnetized in a perpendicular direction and this correspondingly reduces the flux density in the desired direction. This magnetization in the perpendicular direction continues until the flux density in the desired direction has been reduced to the preselected value.

3,609,612
CARRIAGE OR TROLLEY FOR TRAVEL ALONG AN UPRIGHT WALL OF MAGNETIC MATERIAL

Kurt Tibbling, Solna, Sweden, assignor to Asplundpatenter Aktiebolag, Tykovagen, Lidingo, Sweden

Filed Oct. 10, 1969, Ser. No. 865,244
Int. Cl. H01f 7/20
U.S. Cl. 335—289 2 Claims

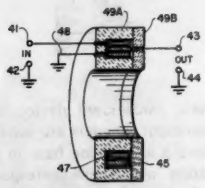
Electromagnetic carriage device designed for traveling along a surface of magnetic material and having runner wheels contacting the surface, each of the runner wheels being mounted within an annular magnet, which is retained at a predetermined distance from said surface by means of the respective runner wheel.



3,609,613
LOW LOSS TRANSMISSION-LINE TRANSFORMER

Robert E. Horn, Middletown, and Octavius Pitzalis, Jr., Fair Haven, both of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Nov. 3, 1970, Ser. No. 86,498
Int. Cl. H01f 15/02, 27/28
U.S. Cl. 336—83 5 Claims



This disclosure relates to transmission-line transformers and particularly to transmission-line transformers formed of parallel-pair conductors. More particularly, this disclosure relates to parallel-stripline or ribbon-type conductors wound about the periphery of a toroidal core to form a pair of inductively coupled, series-connected loops to serve as the halves of a 4 to 1 ratio, transmission-line transformer.

3,609,614
MECHANICALLY VARIABLE HIGH REACTIVE POWER INDUCTOR FOR TESTING CAPACITIVE LOADS, SUCH AS HIGH VOLTAGE ELECTRICAL POWER TRANSMISSION CABLES

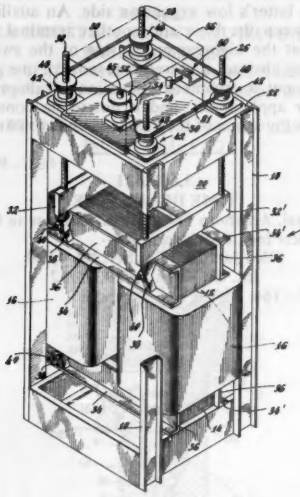
Richard Schutz, Brewster, N.Y., assignor to Hipotronics, Inc., Brewster, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,647
Int. Cl. H01f 21/06
U.S. Cl. 336—134 13 Claims

A mechanically variable high reactive power inductor is described for testing capacitive loads, such as high voltage electrical power transmission cables or large capacitors.

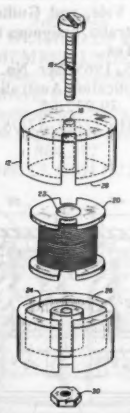
The inductor is formed of upper and lower separable core segments magnetically coupled to electrical windings. The cores are separated in an accurate stable manner to change the inductance of the inductor to tune the inductor into resonance with the capacitance of the load being tested to

obtain effectively a series resonance condition therewith. The upper core segment is suspended from lead screws which are



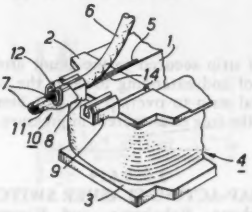
jointly operated by a control capable of varying speed to establish accurate gap control for improved high voltage testing capability.

3,609,615
ADJUSTABLE FERRITE CORES
Richard G. Parker, Wallkill, and Bruce G. Tolen, Goshen, both of N.Y., assignors to Fair-Rite Products
Filed May 21, 1970, Ser. No. 39,327
Int. Cl. H01f 27/24
U.S. Cl. 336—178 13 Claims



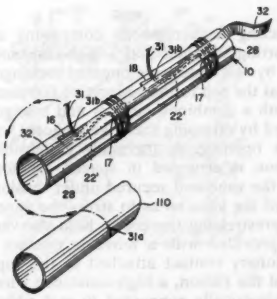
Two halves of a pot core permanently joined together by a mixture of a chemically setting adhesive material and deformable, preferably hollow, plastic type bubbles. The halves are held in position by a center screw which adjusts the parts against each other to a close tolerance fixed inductance while the gapping material therebetween cures, preferably at air or room temperature, the center screw (or outside clamps for C-cores or E-cores) may be removed after the two halves are permanently secured to each other.

3,609,616
BOBBIN ASSEMBLY
Daniel Dumeige, Amiens, France, assignor to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 4, 1970, Ser. No. 86,818
Claims priority, application France, Nov. 18, 1969, 69.39690
Int. Cl. H01f 15/10
U.S. Cl. 336—192 6 Claims



A bobbin assembly comprising a flanged bobbin of electrically insulating material, a coil of enameled wire wound on the bobbin, and a supply lead electrically connected to one end of the wire of the coil, including a projection on a flange of the bobbin, and a connector element having a first portion crimped about an end portion of the wire of the coil and the supply lead and having a second portion crimped about the supply lead and the projection on the flange of the bobbin.

3,609,617
ELECTRICAL INDUCTANCE AND METHOD
Edwin C. Rechel, 85 Lancaster Road, Shirley, Mass.
Filed Nov. 12, 1970, Ser. No. 88,654
Int. Cl. H01f 15/10, 41/00
U.S. Cl. 336—192 5 Claims

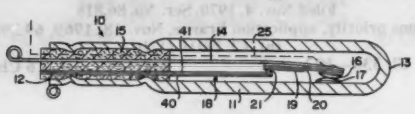


An electrical inductance is formed from a coil form provided with a pair of axially aligned, spaced-apart generally U-shaped slits which provide a pair of tabs foldable outwardly for use in anchoring the wire. A plurality of turns of wire are wound about the coil form over the opening provided by one outwardly folded tab, and the wire is then turned around the first tab and then around the other tab. A strip of tape is then laid down over the tabs and therebetween to anchor the wire in place during extraction to provide an internal lead for the inductance.

3,609,618
THERMOSTAT WITH OVERLAPPED BIMETAL CONTROL STRIPS THEREIN
Alton R. Wells, 4573 West Trade Winds Ave., Lauderdale-by-the-Sea, Fla.
Filed Apr. 29, 1970, Ser. No. 33,014
Int. Cl. H01h 37/52, 61/013, 61/06
U.S. Cl. 337—95 8 Claims

A thermostat, thermal protector, or the like is provided including a shunt strip extending into the casing in cantilever form and where a pair of opposed contacts are usually car-

ried by the free end of the shunt arm and the inside wall of the case in opposed relation. A bimetal strip is secured as a cantilever and its free end overlaps with the free end of a

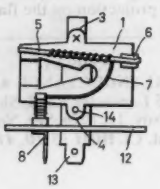


second bimetal strip secured to the shunt arm adjacent the free end thereof and extending towards the secured end of the first bimetal strip to overlap the first bimetal strip and normally have the free ends thereof in pressure contact.

3,609,619
SNAP-ACTING FLASHER SWITCH

Masamitsu Nakano, Yokohama, and Kazumi Shinozuka, Itakomachi, Namekatagun, both of Japan, assignors to Nagatoshi Suzuki, Otaku, Tokyo City, Japan

Filed Oct. 24, 1969, Ser. No. 869,068
Claims priority, application Japan, Nov. 30, 1968, 103908/1968
Int. Cl. H01h *37/02, 37/46*
U.S. Cl. 337—136 **1 Claim**

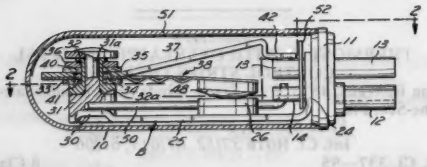


The snap-acting flasher switch comprising an insulated base, a supporting terminal and a high-resistance wire terminal carried by said base, an elongated rectangular resilient vane secured at the top to the supporting terminal. Said vane is provided with a combined circular and triangular opening and prestressed by crimping the edge adjacent to the base of the triangular opening. A thermally expansible and contractable ribbon is arranged in spaced relation along the inner face of the vane and secured under tension at its ends to the edges of the vane so as to stress the vane against the force of the prestressing thereof to hold the vane inwardly. The vane is provided with a movable contact cooperative with the stationary contact attached to the supporting terminal. Around the ribbon, a high-resistance wire is wrapped with its end electrically connected to said ribbon while the other end being connected to the terminal.

3,609,620
THERMOSTATIC SWITCH

Paul R. Lee, Mansfield, Ohio, assignor to Essex International, Inc.

Filed Oct. 13, 1969, Ser. No. 865,792
Int. Cl. H01h *61/02*
U.S. Cl. 337—102 **7 Claims**

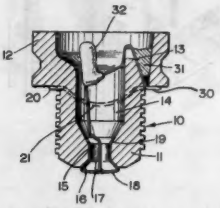


A thermostatic switch having an L-shaped metal base attached to a header which closes one end of a metal housing. Supported from the base, and insulated from it, is a cantilever-mounted bimetal switch blade carrying a mobile contact on its free end for engagement with a stationary contact on the base. A main heater extends between a terminal carried by the header and the mounted end of the bimetal switch blade at the latter's low expansion side. An auxiliary heater extends between the base and another terminal carried by the header at the high-expansion side of the switch blade. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,609,621
TIME DELAY FUSE

Paul P. Danesi, Attleboro Falls, Mass., assignor to Cable Electric Products Inc., Providence, R.I.

Filed Jan. 20, 1970, Ser. No. 4,380
Int. Cl. H01h *85/10, 85/62*
U.S. Cl. 337—166 **3 Claims**

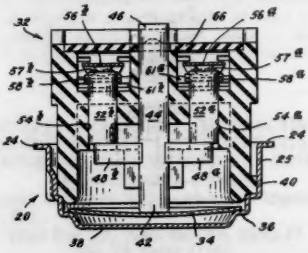


A time delay fuse which is particularly adapted to eliminate failures during a short circuit test. The device uses a high refracting silicon material admixed with a metallic salt which acts as the heat sink. This material replaces the usual additional fusable metal, but will not dissolve or vaporize during a short circuit. Pressures are reduced and the fuse will not burst or otherwise fail.

3,609,622
THERMOSTATIC DEVICE AND MEANS FOR MOUNTING SAME

John Pringle, Elizabeth Vale, and Guillermo Eugen Pecker, Elizabeth, both of Australia, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed June 25, 1969, Ser. No. 836,354
Claims priority, application Australia, July 1, 1968, 39,932/68
Int. Cl. H01h *37/04, 37/08, 37/54*
U.S. Cl. 337—354 **4 Claims**



A thermostatic device including a housing containing a bimetallic disc or strip which engages a cruciform-shaped member, the cross arm of which engages a pair of pins which bear against leaf-spring-type movable contact arms while the stem of the cruciform-shaped member can form reset means providing a simple means for resetting the disc. Mans for mounting the thermostatic device include a plate supporting a plurality of springs, each spring in turn urging a housing of

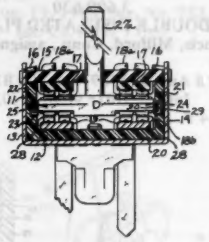
the thermostatic device in a direction away form the plate of the device so that when the plate is secured to a surface the temperature of which is to be sensed, the springs urge the thermostatic housing into contact with the surface.

3,609,623

VARIABLE RESISTANCE CONTROL HAVING HINGED BASED MEMBER

John Zdanys, Jr., Edwardsburg, Mich., and Norman C. Weingart, Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Dec. 22, 1969, Ser. No. 887,228
Int. Cl. H01c 9/02
U.S. Cl. 338—183 14 Claims



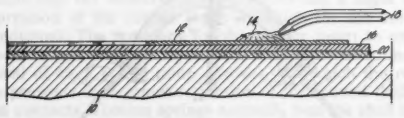
A variable resistance slide control employing a rectilinear slide carrying a contactor wipably engaging a resistance element and a conductive element supported in a housing. A pair of spaced guide means on the slider supported by resilient dielectric guide-supporting means in side members of the housing permits uniform operation of the slider. The guide-supporting means provided in the side members are of the same width throughout the entire length of the housing. The side members are integral with and hingeably secured to the bottom member. In one embodiment tolerance compensators are provided on resilient guide means of the slider for substantially eliminating pitch and yaw of the slider during movement. An operating member secured to the slider extends outwardly through a slot provided in the housing.

3,609,624

STRAIN GAGE AND METHOD OF BONDING THE GAGE TO A MEMBER UNDER TEST

Bella Nagy, Phoenixville, Pa., assignor to Vishay Intertechnology, Inc., Malvern, Pa.

Continuation of application Ser. No. 613,583, Feb. 2, 1967, now abandoned. This application Feb. 20, 1969, Ser. No. 804,357
Int. Cl. G01l 1/22
U.S. Cl. 338—2 8 Claims



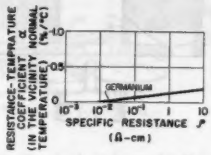
A strain gage of the electrical resistance type is disclosed herein which has improved adhesive means to attaching the gage to a member under test. The adhesive is applied to the gage at the time of manufacture and includes a thermosetting adhesive composition which is substantially nontacky at room temperature, and upon heating to a first elevated temperature wets the surface of the test piece in contact therewith and when heated to a second higher temperature, is converted to the infusible, insoluble state.

3,609,625

SEMICONDUCTOR STRAIN GAUGE

Osamu Watanabe, and Takeshi Shiota, both of Tokyo, Japan, assignors to Kyowa Electronic Instruments Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 615,773, Feb. 13, 1967, abandoned
Filed Apr. 15, 1969, Ser. No. 816,884
Claims priority, application Japan, Feb. 15, 1966, 41/8594
Int. Cl. G01l 1/22
U.S. Cl. 338—3 3 Claims



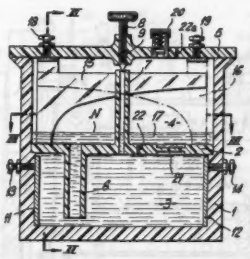
A temperature-compensated strain gauge for affixing to a specimen, fabricated from a vacuum-evaporated thin film semiconductor of P-type germanium bonded to a suitable substrate. The specific resistance of the germanium is selected so that the resistance-temperature coefficient of the gauge when attached to the specimen is substantially equal to zero.

3,609,626

LIQUID RESISTOR APPARATUS

Norbert Roger Beyrard, Paris, France, assignor to Association des Ouvriers en Instruments De Precision, Paris, France, a part interest

Filed Mar. 18, 1969, Ser. No. 808,274
Claims priority, application France, Mar. 27, 1968, 145,623
Int. Cl. H01c 11/00
U.S. Cl. 338—38 7 Claims



Liquid resistor apparatus in which electrically conductive liquid is transferred from a control chamber to a controlled chamber, thereby affecting the electrical resistance between electrodes in the controlled chamber, as a result of evaporation of liquid in the control chamber by control current passed therethrough, there being a liquid passage and a restricted vapor passage connecting the two chambers. The restriction in the vapor passage is set during operation and may be adjustable to govern the operating characteristics of the apparatus.

3,609,627

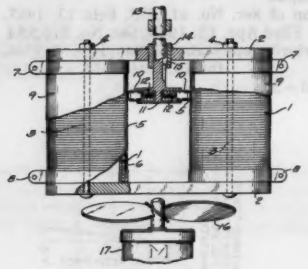
ADJUSTABLE RESISTOR

Lionel E. Weyenberg, N35 W23575 Capitol Drive, Pewaukee, Wis.

Filed Nov. 25, 1968, Ser. No. 778,731
Int. Cl. H01c 1/08
U.S. Cl. 338—53 6 Claims

An adjustable resistance device including a plurality of tubular casings formed of a material having a high rate of thermal conductivity. A resistance coil is wound around the outer surface of each casing and bonded to the casing by an electrically insulating, high-temperature binding material. A sliding

contact is mounted for longitudinal movement along each resistance coil and by adjusting the position of the contact the portion of the resistance coil connected in the circuit can be varied.

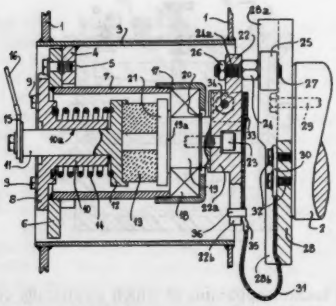


A fan or other fluid-moving device is associated with the tubular casings and acts to circulate air within the interior of the casings. Heat generated within the resistance coil is dissipated by conduction through the tubular casings and by convection to the air passing within the casings.

ERRATUM

For Class 338—128 see:
Patent No. 3,609,648

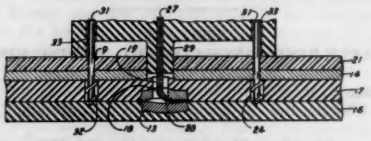
3,609,628
CURRENT-TRANSMITTING DEVICES FOR THE AXLES OF ELECTRIC RAILWAY VEHICLES
Louis Cabaussel, Villeurbanne, France, assignor to Societe "Lucien Ferraz & Cie", Rhone, France
Filed Oct. 13, 1969, Ser. No. 865,558
Int. Cl. H01r *39/64*
U.S. Cl. 339—3 **7 Claims**



A current-transmitting device interposed between the frame of an electric railway vehicle and an axle comprises a nonrotating member and a rotating member resiliently urged against the nonrotating member so as to form therewith a rotating contact unit. The said unit is carried by the frame in front of one of the ends of the axle and the rotating member is mechanically coupled with the axle end by a universal coupling so as to rotate in unison therewith in spite of the various displacements of the axle with respect to the frame. A flexible conductor forms a deformable electric connection between the rotating member and the axle end.

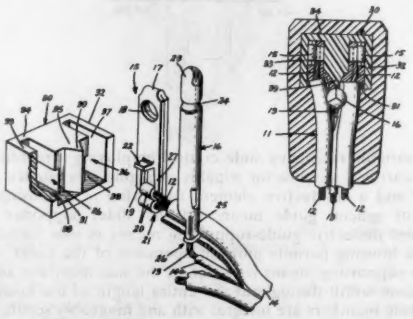
3,609,629
DUCTLESS ELECTRICAL FLOOR COVERING CONDUCTING SYSTEM, AND COMPONENTS THEREFOR
William B. Tenery, 36053 Haley St., Newark, Calif.
Filed July 7, 1969, Ser. No. 839,385
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 R **11 Claims**

A ductless electrical conducting system comprises a flexible strip structure forming part of floor covering on a floor foundation, and having laterally spaced conductors and a protective ground strip thereover, all insulated from each other. Access openings in the top of the strip structure for electrical connectors and for fastening screws to attach a



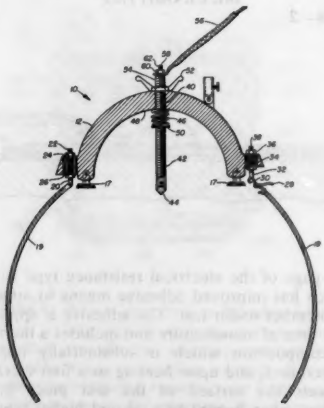
connector device, are provided with removable plugs when connection is required. Sets of such access openings at predetermined locations along the strip structure enable selection of locations for electrical connection.

3,609,630
DOUBLE INSULATED PLUG
Wallace R. Francis, Milford, Conn., assignor to General Electric Company
Filed Apr. 2, 1969, Ser. No. 812,597
Int. Cl. H01r *9/08, 11/02*
U.S. Cl. 339—14 P **2 Claims**



A double insulated plug includes a preformed housing of insulating material. The plug contacts and corresponding conductors of a cord are electrically and mechanically joined to form connections. The connections are received in the preformed insert in spaced-apart relationship with the insert substantially encasing the connections. A body of insulating material is molded around the insert and the connections.

3,609,631
ADJUSTABLE GROUND CLAMP
Robert L. Looney, 4816 South Madison, Tulsa, Okla., and John S. Work, 3742 East 45th Place, Tulsa, Okla.
Filed Jan. 23, 1969, Ser. No. 793,520
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 **8 Claims**



A ground clamp for a pipe-welding apparatus includes an arcuate support member positionable upon and insulated

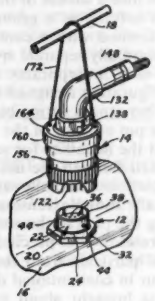
from the work to be welded and flexible chain or cable means attachable to the support frame, and adjustable and lockable to secure the ground clamp into position upon the work. The support frame includes a sharply pointed grounding member biasable against the work to be grounded and having one end in ground connection to the welding apparatus. The ends of the ground clamp resting upon the work includes insulating members to insulate the frame from the work and the point of connection of the flexible chain or cable may also include insulating means to insulate the chain or cable from the work.

3,609,632

RELEASABLE ELECTRICAL CONNECTOR

Ottomar H. Vetter, Minneapolis, Minn., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 19, 1968, Ser. No. 753,690
Int. Cl. H01r *13/62*
U.S. Cl. 339—14 30 Claims



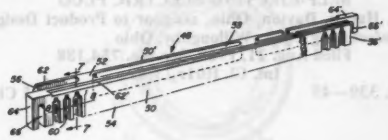
A releasable electrical connector is composed of two halves or components, one being of conventional construction and having a shell provided with a plurality of socket contacts and radially directed bayonets that are latched with the other half or component constructed in accordance with the invention. After the bayonets are inserted into slots formed in a pawl carrier sleeve in the second connector half, the carrier sleeve is angularly shifted in a direction to effect latching of the pawls with the bayonets. The pin contacts are mounted in a rubber insert contained in a shell belonging to the second connector half; a grounding ring encircles the last-mentioned shell. Through helical ramp grooves formed on the exterior of the shell and antifriction rollers extending inwardly from an encircling drive sleeve, the rectilinear movement required for shell advancement is derived from rotation of the drive sleeve. The shell advancement first results in the spring tines of the grounding ring moving into the shell of the first connector half, then the entry of the pin contacts into the socket contacts, and finally a slight facial compression of the rubber insert in which the pin contacts are mounted. The tendency for the rubber insert to expand provides a seal and in conjunction with a detent formed at one end of each of the ramp grooves into which the rollers move prevents inadvertent retraction of the second shell and its pin contacts. Tension springs normally bias the shell into a retracted position, but the action of these springs is easily overcome during the coupling process. Relatively rotatable pin and groove means on the carrier and drive sleeves become effective at the end of the coupling procedure to assure that the pawls and bayonets will remain latched until their release is desired. An indicator, capable of being both seen and felt, is forced outwardly to signify that the two halves are fully mated and latched. A lanyard is anchored to the improved connector half and a 360° swiveling can be realized. When a predetermined load is applied to the two halves, they pull apart. A backshell can be securely attached in any angular position to the second connector half.

3,609,633

CIRCUIT BOARD CONNECTORS

Hoke S. Hargett, 3107 Roberta, Largo, Fla.

Filed Sept. 23, 1968, Ser. No. 761,414
Int. Cl. H05k *1/04*
U.S. Cl. 339—17 5 Claims



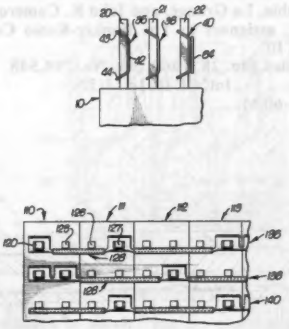
A two-part connector assembly including a female connector having asymmetrical contact elements which prevent simultaneous mechanical resonance of the elements. A mating male connector includes barbed pin contacts securely embedded within a block.

3,609,634

ELECTRICAL CONNECTOR

Vram E. Hovnanian, Sherman Oaks, and Edward Kitzmiller, Manhattan Beach, both of Calif., assignors to Logic Dynamics, Inc., El Segundo, Calif.

Filed Oct. 7, 1969, Ser. No. 864,386
Int. Cl. H01r *31/08, 11/22*
U.S. Cl. 339—19 2 Claims



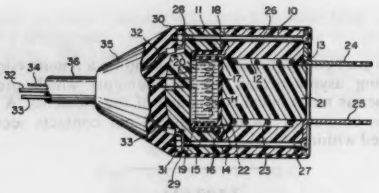
An electrical connector of resilient conductive material such as copper for attachment to a longitudinally extending terminal post. The connector may constitute one of a plurality of identical modular connectors formed integrally in a strip for electrically connecting together a number of such posts in spaced parallel relation such as wire wrap posts projecting from a plate or panel having an array of posts arranged in columns and rows. The connector includes a generally flat central web provided with a pair of integrally formed wings projecting oppositely from the web and being resiliently bendable forwardly from the plane of the web, each wing having a post-receiving aperture formed therein. In use, with a terminal post projecting through the apertures of a pair of wings, the resiliency of the material causes the wings to contact the post along the aperture distal edges and thus to retain the web in close abutment and good electrical contact with the terminal post. The entire joint is visible for inspection, and may be soldered if desired. Bypassing of a

selected terminal post may be accomplished by cutting off the wings corresponding to that post, and insulating the web from contact with the bypassed post, as by a sleeve of dielectric material surrounding the web. A backing strip of conductive material may be attached to the web as by spot welding, in order to increase the strength and current-carrying capacity of the strip.

3,609,635
SELF-EJECTING ELECTRIC PLUG

Lee M. Harris, Dayton, Ohio, assignor to Product Design & Manufacturing Corp., Willoughby, Ohio

Filed Aug. 21, 1968, Ser. No. 754,188
Int. Cl. H01r *13/62*
U.S. Cl. 339—45 **5 Claims**

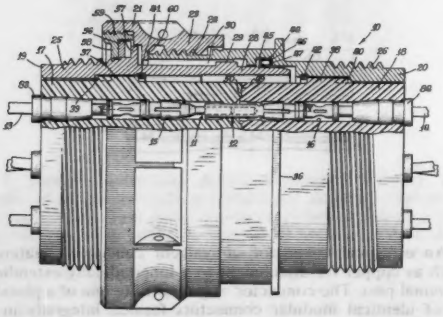


The plug includes a plunger normally spring retracted between the prongs and a chamber containing thermally expansible material and an electric heater which is the plug cord circuit, a remote switch closure energizing the heater to expand the material against the plunger to drive it outwardly and eject the plug from the receptacle.

3,609,636
ELECTRICAL CONNECTORS

William J. Kubin, La Grange, and John K. Cameron, Hillside, both of Ill., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Jan. 28, 1969, Ser. No. 794,548
Int. Cl. H01r *13/52*
U.S. Cl. 339—60 M **6 Claims**

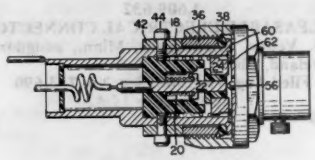


Electrical connectors having a "monodielectric" construction in which the configuration of engaging end surfaces of contact-supporting dielectric members and the characteristic of the material of the members are such as to provide a reliable fluid seal while providing firm mechanical contact support. Specific features relate to the provision of risers on one dielectric member which telescope in the ends of passages on the other, to the use of a semihard material, preferably a polymer material operable continuously at high temperatures, to the elimination of air pockets so as to provide high corona resistance, and to the use of a wave spring arrangement for obtaining optimum pressure engagement. Contact retention members are provided having spring fingers of a hard material engageable with contacts of soft material, permitting removal and replacement of the contacts without destruction of the retention member or the dielectric.

3,609,637
ELECTRICAL CONNECTOR

Clyde C. Cole, 5298 Harvard St., Ventura, Calif.

Filed Dec. 1, 1969, Ser. No. 881,021
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 R **1 Claim**

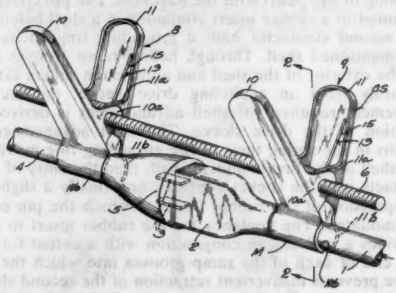


A plug for insertion into a socket of the type having a disk-shaped base member serving as a ground connection, such base member being formed with a central opening through which projects an electrically separate spring-loaded pin contact. The invention plug incorporates a "floating" ground plate of annular configuration designed for engagement with the socket base member, and a spring-biased axial conductor in alignment with the pin contact of the socket. A feature of the plug design is that the necessity for screwing the plug into the socket is eliminated through the use of a quick-connect-disconnect lever which is manually actuatable through a small angle to cause the radial extension of a deformable O-ring, thereby securing the plug in the socket after it has been linearly inserted thereinto. This precludes the possibility of abrading small metal particles from the respective contact surfaces, as may occur in conventional designs when engagement therebetween is brought about by relative rotational movement of plug and socket.

3,609,638
EXTENSION CORD COUPLING CLAMP ASSEMBLY

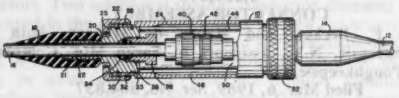
John J. Darrey, 540 South Creek Road, Racine, Wis.

Filed June 3, 1970, Ser. No. 43,024
Int. Cl. H01r *13/54*
U.S. Cl. 339—75 P **12 Claims**



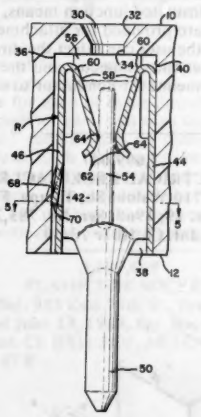
An extension cord clamp assembly for detachably securing the ends of extension cords or cables together to prevent accidental disconnection of the plug and socket. The clamp assembly has a pair of spring-loaded, butterfly-type clamps which clamp on the cord ends, the clamps being mounted on a threaded, roughened or serrated rod to thereby hold them against relative displacement. The spring urges the clamps into tight and secure engagement with the rod, but permits ready adjustment along the rod when the butterfly wings of the clamps are squeezed together to release the jaws of the clamps.

3,609,639
UNDERWATER ELECTRICAL CONNECTOR APPARATUS
Larry W. Lind, La Mesa, Calif., assignor to United States Elevator Corporation, Spring Valley, Calif.
Filed June 30, 1969, Ser. No. 837,472
Int. Cl. H01r 13/54
U.S. Cl. 339—89 M 7 Claims



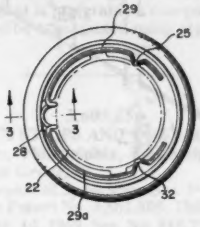
An underwater electrical connector apparatus comprising a sealed housing in which electrical lines are electrically connected by an electrical connector, and which housing has a cylindrical shape with cylindrical end seals, through which electrical lines pass, which seals are drawn together by end collars with an insulating spacer sleeve that fits around the electrical connector and correctly spaces the seal members to achieve correct connection of the electrical lines, and which structure allows the housing to be entirely removed slidably from the structure while maintaining electrical connection of the electrical connector.

3,609,640
PRECISION RECEPTACLE ALIGNMENT SYSTEM
Bruce Cameron Longenecker, Harrisburg, and Charles Edward Reynolds, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 17, 1969, Ser. No. 877,352
Int. Cl. H01r 13/54
U.S. Cl. 339—91 R 8 Claims



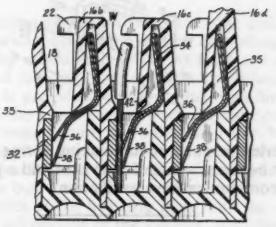
A system is disclosed which features precision alignment of receptacles having depending terminals thereon within headers adapted to receive integrated circuit components thereon. The individual header is made of a suitable insulating material and has a plurality of apertures therein, each of which has two intersecting surfaces precisely located relative to a master reference point. The receptacles have plural spring means thereon which bias the receptacle into the corner defined by the intersecting surfaces. The receptacles also have spring contact fingers at the end opposite the depending terminal for receiving posts or leads form an integrated circuit component. The header has located thereon plural latching features for positively retaining thereon an integrated circuit component.

3,609,641
FLEXIBLE BULB SUPPORT MEANS
Edward J. Luce, Wayland, and Joseph F. Arnao, Needham, both of Mass., assignors to TRW Inc., Cleveland, Ohio
Filed June 18, 1969, Ser. No. 834,258
Int. Cl. H01r 33/12
U.S. Cl. 339—93 3 Claims



This a bulb-support means which has a flexible element protruding into the cavity for engagement with a bulb to hold the bulb against excessive movement when it is subjected to shock or vibration. One type of support means uses a flexible metal spring member and another type uses an element formed of rubber or elastomer.

3,609,642
WIRE TERMINALS
Alexander R. Norden, 350 Central Park West, New York, N.Y.
Division of Ser. No. 563,248, July 6, 1966, Patent No. 3,417,368.
Filed Dec. 4, 1968, Ser. No. 804,029
Int. Cl. H01r 9/08
U.S. Cl. 339—95 D 7 Claims

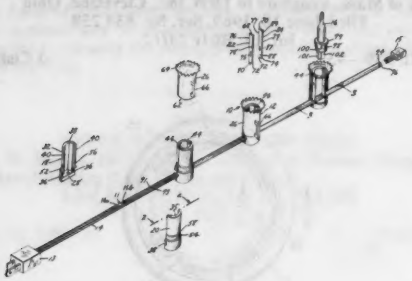


A terminal block in which there are plural groups of wire-receiving guide passages, each group being for wires to be connected to each other. For each group of passages (three to a group in the example shown) there is an internal metal strip that is relied on primarily for the electrical connection. A leaf spring member has separately resilient portions for biasing inserted wires against the metal strip. Each leaf spring portion inclines toward the wire and extends along the wire in the direction of insertion, forming an acute angle to the wire. The edge of the leaf spring at the end of each wire-engaging portion tends to dig into the wire when resisting pull applied to the wire.

3,609,643
DECORATIVE MIDGET LIGHT STRING
Maxwell H. Connan, 53 Roosevelt Ave., Glen Head, N.Y.
Continuation-in-part of application Ser. No. 736,668, June 13, 1968, now abandoned. This application Feb. 25, 1970, Ser. No. 14,108
Int. Cl. H01r 7/04
U.S. Cl. 339—97 L 2 Claims

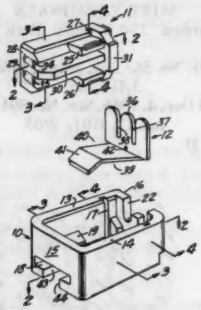
A string of decorative miniature light bulbs arranged in a series connection, and predeterminately spaced along a piece

of standard parallel insulated electric conductor wire, in which the bulb sockets clamp upon the wire, make solderless



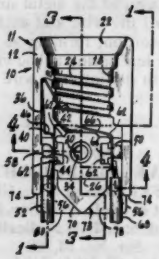
connection therewith, and disengageably receive the bulbs; and methods for fabricating the same.

3,609,644
MAIN FRAME CONNECTOR AND METHOD
William J. Seim, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 20, 1969, Ser. No. 867,532
Int. Cl. H01r *9/08*
U.S. Cl. 339—98 **2 Claims**



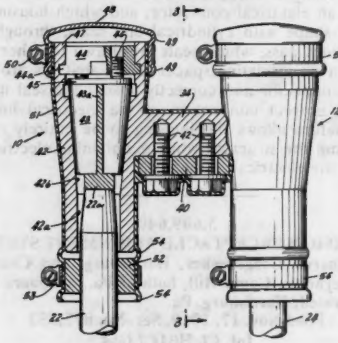
A solderless connector for making spring reserve electrical contact between a main frame post and a pair of insulated wires in a communications installation.

3,609,645
INCANDESCENT LAMPHOLDERS, ESPECIALLY OF THE CANDELABRA SOCKET TYPE
David H. Turner, Trenton, N.J., assignor to Circle F. Industries, Inc.
Filed Sept. 24, 1969, Ser. No. 860,581
Int. Cl. H01r *13/58, 17/20*
U.S. Cl. 339—107 **4 Claims**



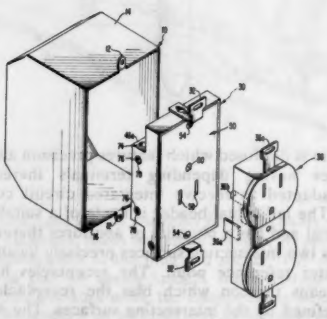
An incandescent lampholder, usually of the miniature or "candelabra" type and designed for use by original equipment manufacturers, is former at its base end with a pair of wiring openings or wireways that are defined by a triangular or wedge-shaped divider, the walls of which converge toward said end. Each wireway opens upon both the bottom and side of the lampholder, so that the wires can exit from the lampholder in a direction normal to the longitudinal axis thereof, parallel or oblique thereto, or in any combination of these directions.

3,609,646
CONNECTOR ASSEMBLY
Stephen P. Becker, and Henry R. Wengen, both of Poughkeepsie, N.Y., assignors to Fargo Mfg. Company, Inc., Poughkeepsie, N.Y.
Filed Mar. 6, 1969, Ser. No. 804,837
Int. Cl. H01r *3/02, 3/06*
U.S. Cl. 339—116 **3 Claims**



A rugged and compact connector assembly for a plurality of connections for direct burial applications providing permanent, watertight, insulated junction means, in which a plurality of connectors are provided for attachment to a bus bar in such manner that the user can select the direction in which a conductor will enter the connector and the direction from which the attaching means for conductor to connector is accessible.

3,609,647
ELECTRICAL RECEPTACLE
Angelo Castellano, 2710 Walnut St., Tampa, Fla.
Filed Dec. 19, 1968, Ser. No. 785,264
Int. Cl. H01r *13/60*
U.S. Cl. 339—122 **19 Claims**



An electrical receptacle adapted to be secured in a power outlet box for interconnecting the prongs of a plug receptacle

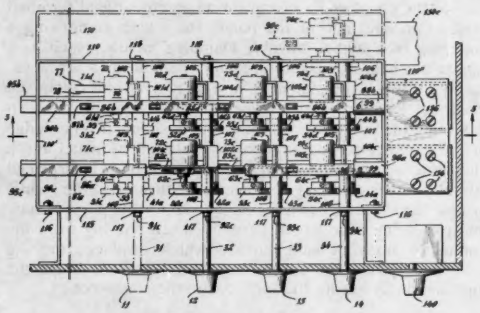
or wall switch to the powerlines leading into the outlet box. The receptacle has a plastic casing including a pair of metallic tubular conductors extending along opposite sidewalls of the casing against the backwall of the casing. Powerlines extend through the tubular conductors and are secured thereto by screws mounted transversely in the sidewalls of the tubular conductors. A plastic cover plate closes the receptacle and has three apertures respectively aligned with two conductor prongs secured to the tubular conductors and a third ground prong secured in the casing between the tubular conductors. Two additional tubular conductor elements are also secured in the casing, each having a screw for securing wires therein to enable the receptacle to accommodate various wiring or switch connections. Apertures are provided in the casing in axial alignment with the tubular conductors to facilitate insertion of wires therein. Similarly, apertures are provided in the casing to expose the screws for adjustment externally of the casing.

3,609,648

SYSTEMS FOR CONTROLLING A PLURALITY OF VARIABLE FUNCTIONS OF AN INSTRUMENT

Joseph M. Sebas, Stratford, and Charles F. DeMey, II, West Redding, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 18, 1970, Ser. No. 38,354
Int. Cl. H01c *5/02, 9/02*
U.S. Cl. 338—128 **8 Claims**



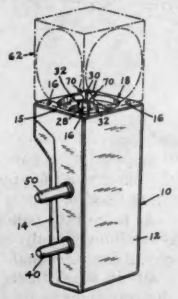
In an instrument (e.g., a spectrophotometer) having various operating parameters or functions, various groupings of a particular value for each of these functions (e.g., scan time, slit program, amplifier gain, and scan suppression) can be "set" or "stored," for example on different potentiometers, for "recall" or use. Each "set" or "stored" condition of each function may be "reset" separately, and a particular grouping (e.g., four) of these new individual function values can then be "recovered" for use together by merely "addressing" or "choosing" a particular (mode) grouping.

3,609,649

FLASHCUBE SOCKET

Venerio J. Rigolini, 933 East 78th St., Brooklyn, N.Y.

Filed June 13, 1969, Ser. No. 833,013
Int. Cl. H01r *3/00, 13/54, 13/62*
U.S. Cl. 339—147 P **11 Claims**



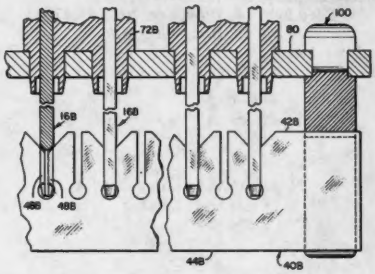
A flash device including a socket arrangement for receiving and retaining flashcubes in which the socket includes a base, a stabilizing stud centrally mounted on the base and a pair of retaining fingers mounted on top of the stud is disclosed. The fingers have a projection which extends radially outwardly beyond the stud and over the flashcube center post. A pair of upwardly extending arcuate members spaced on diametrically opposite sides of the stud lie in the rotational path of the flashcube lugs so as to locate the flashcube in any one of a plurality of predetermined aligned rotational positions. The socket is preferably a one-piece molded device though it may also be constructed using separate parts.

3,609,650

BUS STRIPS AND CONTACTS

Thomas J. Stokes, Philadelphia, Pa., assignor to Elco Corporation, Willow Grove, Pa.

Continuation-in-part of application Ser. No. 759,343, Sept. 12, 1968, now Patent No. 3,562,805. This application Apr. 14, 1969, Ser. No. 815,772
Int. Cl. H05k *1/07*
U.S. Cl. 339—176 MP **4 Claims**



An electrical contact for use in a card-edge connector has a nose portion with a bifurcated section comprising a pair of legs separated by a bifurcating slot. At least one chamfered surface is coined into the contact below the bifurcating slot, and a bus strip is provided with a similar chamfered surface for mating with the chamfered surface on the contact when the bus strip is inserted into the bifurcating slot. In an alternative embodiment of the invention, a slit, defined in part by four chamfered surfaces, is provided in the tail portion of the contact, and the bus strip is inserted into the slit so that the chamfered surfaces of the bus strip mate with the chamfered surfaces on the tail portion of the contact. A further embodiment of this invention comprises a card-edge contact which has flat, parallel, uncoined surfaces below the bifurcating slot, and a bus strip which has a contact-receiving slot defined, in part, by inwardly facing projections having contact-engaging surfaces thereon. The bus strip is inserted into the bifurcating slot of the contact with the flat, parallel, uncoined surfaces of the contact positioned within the contact-receiving slot of the bus strip.

3,609,651

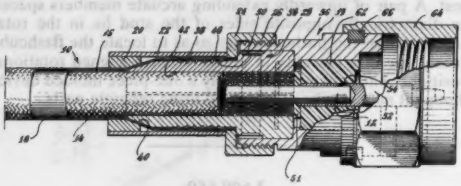
METHOD AND APPARATUS FOR SECURING A CONNECTOR TO A COAXIAL CABLE

Norbert Joseph Sladek, Fairfield, and John Phillip Treschitta, Norwalk, both of Conn., assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.

Filed Nov. 17, 1969, Ser. No. 877,066
Int. Cl. H01r *17/04, 5/10*
U.S. Cl. 339—177 E **1 Claim**

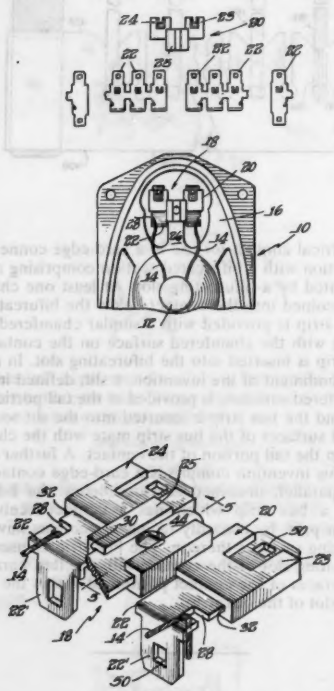
A method and apparatus for securing a connector to a coaxial cable, and in particular to a multilayer core coaxial cable, without causing any damage or disturbance to the core. A split ferrule is fitted together over an exposed portion of the core at the end of the cable and is then pushed back with a sleeve formed on the rear of the ferrule being forced between the cable core and outer conductor. When the fer-

rule is in place, it is secured to the cable by suitable means, such as crimping, and the forward portion of the ferrule is



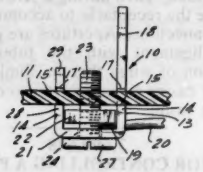
utilized to secure the ferrule, and thus the cable, to a connector body.

3,609,652
SOLDERLESS TERMINAL STRIP CONNECTOR ASSEMBLY
Robert W. Sebastian, Villa Park, Ill., assignor to Molex Products Company, Downers Grove, Ill.
Filed Feb. 14, 1969, Ser. No. 799,470
Int. Cl. H01r 9/00, 7/06
U.S. Cl. 339—198 R **7 Claims**



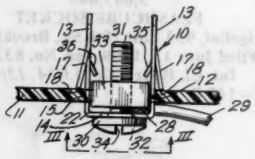
A solderless electrical connector assembly for joining one or more wire leads to a terminal. The assembly includes a base or terminal block member constructed of insulating material such as polypropylene or the like, and one or more terminal strip members slidably associated therewith. Each terminal strip is provided with slots or apertures to accommodate one or more wire leads such that the terminal strip may be moved relative to the terminal block member to clamp said leads therebetween in conductive association with the terminal strip.

3,609,653
ELECTRICAL CONNECTOR AND METHOD OF AND MEANS FOR ATTACHING THE SAME
William H. Wallo, 930 N. Pitner Ave., Chicago, Ill.
Filed Oct. 22, 1968, Ser. No. 769,533
Int. Cl. H01r 13/50
U.S. Cl. 339—214 R **19 Claims**



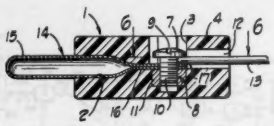
An electrical connector has edge shoulder and clenching lug means for firmly retaining it on a supporting panel, such as a binding post board, with a solder lug projecting from one face of the panel and a clamp for an electrical lead terminal at the opposite face of the panel, the clamp comprising a clamping base and a movable clamping member such as a square nut held against turning and operable by a screw extending through the clamping base to receive and clamp the electrical lead terminal between the nut and the base. In mounting the connector on the panel, a shoulder on an edge of the connector body engages one face of the panel and a clenching lug on that edge of the connector body is displaced laterally into clamping engagement thrusting the panel against the shoulder, an attachment tool for the purpose having a shearing edge which partially severs the lug from the connector body, a cam surface which displaces the lug toward the panel, and a clenching shoulder which thrusts the lug clampingly toward the shoulder on the connector.

3,609,654
SNAP-IN ELECTRICAL CONNECTOR
William H. Wallo, 7401 N. Sheridan, Chicago, Ill.
Filed Feb. 2, 1970, Ser. No. 7,666
Int. Cl. H01r 9/12, 7/12
U.S. Cl. 339—217 S **12 Claims**



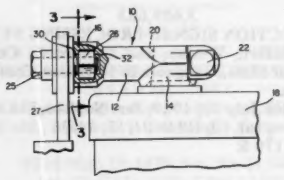
A generally U-shaped electrical connector is adapted to be mounted on a supporting panel by aligning it with a complementary aperture in the panel and then pressing the connector into position such that fixed shoulders adjacent a base of the connector engage one face of the panel and shear-formed resilient retaining lugs retainingly confront the opposite face of the panel. An electrical lead terminal clamp device comprises a headed screw with its shank freely extending through a hole in the base of the connector and a nut threaded on the screw shank whereby lead terminals may be clamped to either face of the connector base.

3,609,655
ELECTRICAL CONNECTOR
John Tymkewicz, c/o Marlin Mfg. Corp., 12404 Triskett Road, Cleveland, Ohio
Filed Oct. 30, 1969, Ser. No. 872,500
Int. Cl. H01r 9/08
U.S. Cl. 339—217 4 Claims



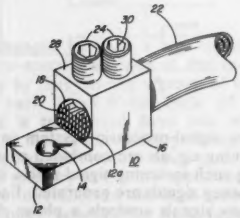
The disclosure herein is of an electrical connector and particularly such of the same as is used in making connections for thermocouples to panel boards or the like, and is directed to the manner of connecting the conductors to the connector itself so that it is unnecessary to wind the same about a terminal post, but on the other hand the conductors may be inserted directly, manipulation of a fastener resulting in an interlocking action to retain the conductor in position, all the same being supplied in a molded body so that connection and disconnection may be easily resorted to and yet no short circuiting of the connections is possible in ordinary use of the connector.

3,609,656
BATTERY TERMINAL CABLE ADAPTOR
Delight E. Breidegam, Jr., College Hill, Kutztown, Pa.
Filed Feb. 12, 1970, Ser. No. 10,774
Int. Cl. H01r 11/26
U.S. Cl. 339—230 R 4 Claims



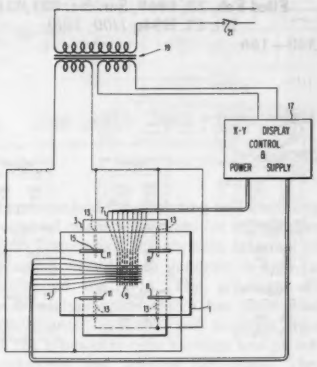
An adapter comprising an elongated body having means on one end for reception of the terminal post of a standard automobile battery and means on the other end adapted to receive the connector of a battery cable of the type used with batteries having threaded terminals.

3,609,657
ELECTRICAL CONNECTOR
Harris I. Stanback, Lexington, Ky., assignor to Square D Company, Park Ridge, Ill.
Filed Oct. 7, 1969, Ser. No. 864,421
Int. Cl. H01r 11/10
U.S. Cl. 339—272 R 7 Claims



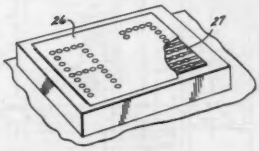
A connector for use with electrical cables comprising a cable-receiving body having two binding screws threaded through respective openings in a flat sidewall of the body and positioned to exert pressure on opposite sides of the longitudinal axis of a cable received in the body.

3,609,658
PILOT LIGHT GAS CELLS FOR GAS PANELS
Parviz Soltan, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 2, 1969, Ser. No. 829,692
Int. Cl. H01j 1/00, 7/30
U.S. Cl. 340—166 R 3 Claims



In a plasma display panel consisting of gas enclosed between adjacent insulating members, a light source in the panel is used to supply a number of uniformly spaced charged particles in the gas to permit firing of the gas when coordinate conductors identifying a site location are energized. The light source may comprise in a preferred embodiment one or more critically placed pilot lamps or auxiliary conductors in the display matrix which are constantly energized or a plurality of light sources positioned adjacent display areas. The use of such pilot lamps facilitates cell selection and firing, with uniform selection and firing potentials within all sites of the display panel.

3,609,659
THERMAL DISPLAY UNIT
Raymond Davis, 13942 Brenan Way, Santa Ana, Calif., and Charles K. Krill, 3030 Aha Laguna Blvd., Laguna Beach, Calif.
Filed Jan. 27, 1969, Ser. No. 794,029
Int. Cl. H05b 3/20
U.S. Cl. 340—166 7 Claims



This invention relates to improvements in display units, and it relates particularly to units in which the display utilizes temperature differences and principally where the temperature difference are made to provide a visual display. The specification discloses a rectangular coordinate printer and plotter incorporating a matrix of semiconductor rectifier junctions connected in rows and columns whereby selected ones of the rectifiers may be rendered conductive. Heat generated in the rectifier is conducted to the surface of a

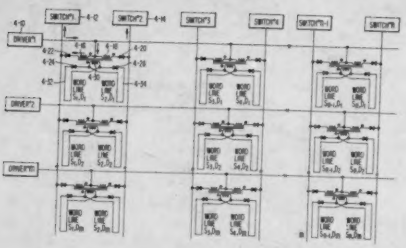
platen where it acts upon a thermally sensitive paper which changes color at the point of heat application. Two forms of platens are illustrated and described. In one the several rectifiers of the matrix comprise discrete units interconnected by conductor deposits and wires. In the other, the several rectifiers are formed as a monolithic structure of semiconductor material.

3,609,660

MEMORY WORD LINE SELECTION APPARATUS USING A DOUBLE-DUTY CENTER-TAPPED TRANSFORMER

Frederic C. Doughty, Valley Forge, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 20, 1969, Ser. No. 801,021
Int. Cl. H04q *1/00, 3/00*
U.S. Cl. 340—166 **10 Claims**



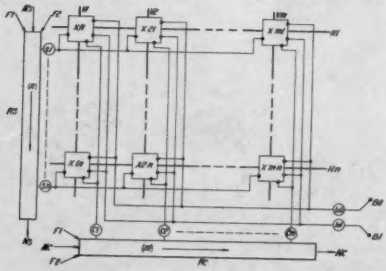
The present invention discloses a transformer and its associated circuitry which, when utilized to selectively address the word lines of a computer memory, halves the number of transformers usually required. The transformer disclosed has a pair of primary windings and a single secondary winding. A plurality of diodes are included in the associated circuitry. The apparatus is then shown wired into a memory word selection matrix of n switches and m line drivers.

3,609,661

MATRIX HAVING MOS CROSS-POINTS CONTROLLED BY MOS MULTIVIBRATORS

Jacques Marcel Hennes, Paris; Marc Jean Pierre Leger, Issy-les-Moulineaux, and Claude Paul Henri Lerouge, Maurepas, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 14, 1969, Ser. No. 824,583
Claims priority, application France, May 17, 1968, 152195
Int. Cl. H04q *3/00*
U.S. Cl. 340—166 **4 Claims**



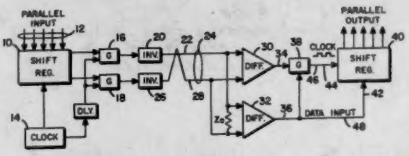
An electronic switching system employing MOS monolithic transistors in a matrix of cross-points is disclosed. Control of the cross-points is provided by shift registers which operate in response to codes instead of a free running clock. Individual cross-points in the matrix can be closed regardless of the status of the other cross-points in the respective line.

3,609,662

SERIAL PULSE DIGITAL TRANSMISSION SYSTEM

David F. Grimm, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 23, 1969, Ser. No. 868,681
Int. Cl. H04q *1/32*
U.S. Cl. 340—168 **3 Claims**



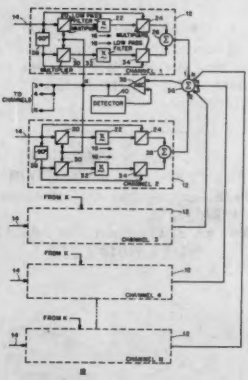
A serial digital transmission system is described wherein the sending station is connected to a receiving station by way of a pair of conductors. Digital data in parallel form is applied as an input to a shift register at the transmitting station and the serialized information is shifted out of this register at a rate determined by a digital clock. Data signals of a first binary significance are applied to a first of the pair of conductors whereas digital signals of the opposite significance are applied to the second conductor. At the receiving point, a pair of differential amplifiers are connected to the transmission line to receive the digital signals. The outputs from the pair of digital amplifiers are connected to a NAND logic circuit which serves to reconstitute the clock. The output from one of the differential amplifiers at the receiver is connected to the serial data input terminal of a receiving shift register and digital data appearing on this line is entered into the shift register at a rate determined by the reconstituted clock signal to make available at the output of the shift register a digital word in parallel form.

3,609,663

PREDETECTION SIGNAL-PROCESSING SYSTEM

William J. Bickford, Weston, and Richard G. Cease, Westwood, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed July 30, 1969, Ser. No. 846,214
Int. Cl. H04b *01/12, 01/26*
U.S. Cl. 340—170 R **7 Claims**



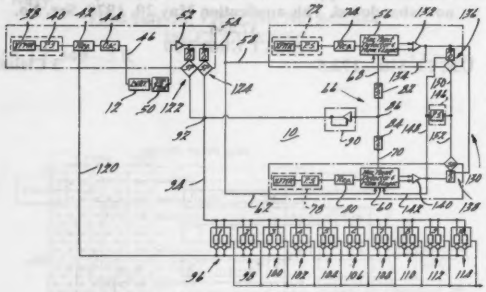
A regenerative signal-processing system in which a multiplicity of incoming signals are combined prior to detection. By heterodyning each incoming signal with a common signal, difference frequency signals are generated. Each of these difference frequency signals controls a phase shift that is applied to the corresponding incoming signal and a resultant signal is formed and all resultant signals have the same phase and are combined to produce an output signal which is in the same frequency band as the incoming signal.

3,609,664

AUTOMATIC CONTROL FOR MEASURING CLEARANCES

Paul E. Bosen, Warren, Mich., assignor to The Cross Company, Fraser, Mich.

Filed Sept. 15, 1967, Ser. No. 668,004
Int. Cl. H04q 9/06
U.S. Cl. 340—172 30 Claims



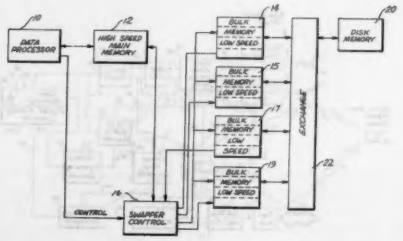
An automatic control for detecting and averaging maximum signal peaks and minimum signal valleys wherein the variation in signal level is sensed and fed to a pair of detectors, the first detector providing an output signal indicative of the maximum signal level and the second detector providing an indication of the minimum signal level. The maximum and minimum signal levels are fed through an averaging circuit to provide a mean or average of the maximum and minimum signals, the mean signal being utilized to control the operation of the signal generator.

3,609,665

APPARATUS FOR EXCHANGING INFORMATION BETWEEN A HIGH-SPEED MEMORY AND A LOW-SPEED MEMORY

Reinhard K. Kronies, Glendora, and Iver C. Hansen, Arcadia, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 19, 1970, Ser. No. 21,040
Int. Cl. G11c 9/00; G06f 13/00
U.S. Cl. 340—172.5 11 Claims



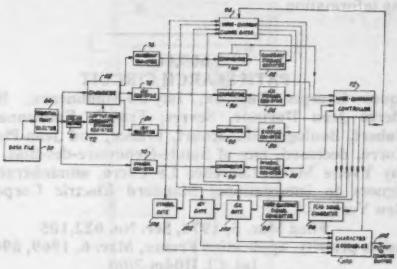
Data is exchanged between a high-speed memory and a plurality of low-speed memories at the speed of the high-speed memory by time-sharing a group of low-speed memories. During each Read-Write cycle of the high-speed memory, data is transferred from one of the low-speed memories to the high-speed memory during the Read operation of the high-speed memory cycle and transferred from the high-speed memory to the low-speed memory during the following Write operation of the high-speed memory. Both transfers take place between the Read operation and Write operation of the Read-Write cycle of the low-speed memory. By overlapping in time the Read-Write cycles of the low-speed memories, the exchange transfer takes place at a rate determined by the Read-Write cycle time of the high-speed memory.

3,609,666

DATA TERMINAL SYSTEM

Lawrence J. Kamm, San Diego, and Herbert A. Schwan, Encinitas, both of Calif., assignors to Typagraph Corporation, San Diego, Calif.

Filed Mar. 18, 1970, Ser. No. 20,493
Int. Cl. G06f 1/00
U.S. Cl. 340—172.5 23 Claims



Apparatus and method for analyzing and encoding graphical data into a serial character stream for transmission over a communications system to a remote data terminal where the character stream is decoded to generate a high resolution graphical display of the data. The graphical display is generated on a teletypewriter which has been modified to permit relatively small, positive and negative incremental movements of the typewriter-type carriage and platen in their respective horizontal and vertical directions. The coding scheme includes analyzing the graphical data on an incremental point-to-point basis to determine the quadrant of movement to the next point, the horizontal and vertical increments, and the symbol to be printed. The data is also analyzed to detect information which is invariable over a plurality of points and such information is commanded to be stored in the receiving remote data terminal. Thereafter, only variable information is transmitted to the remote terminal until one of the invariable items of information changes.

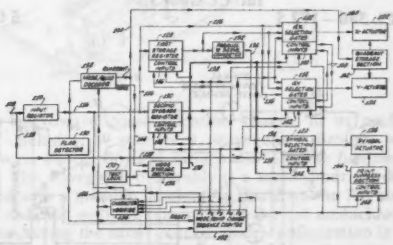
Alternate apparatus and methods are disclosed for further reduction of the transmission of invariable information and for suppressing the printing of symbols which contain graphing information.

3,609,667

DATA TERMINAL SYSTEM

William G. Messer, Chula Vista, Calif., assignor to Typagraph Corporation, San Diego, Calif.

Filed Mar. 18, 1970, Ser. No. 20,724
Int. Cl. G06f 3/14
U.S. Cl. 340—172.5 6 Claims



Apparatus and method for analyzing and encoding graphical data into a serial character stream for transmission over a communications system to a remote data terminal where the character stream is decoded to generate a high resolution graphical display of the data. The graphical display is generated on a teletypewriter which has been modified to permit relatively small, positive and negative incremental movements of the typewriter type carriage and platen in their respective horizontal and vertical directions. The coding scheme includes analyzing the graphical data on an incremental point-to-point basis to determine the quadrant of movement to the next point, the horizontal and vertical in-

crements, and the symbol to be printed. The data is also analyzed to detect information which is invariable over a plurality of points and such information is commanded to be stored in the receiving remote data terminal. Thereafter, only variable information is transmitted to the remote terminal until one of the invariable items of information changes.

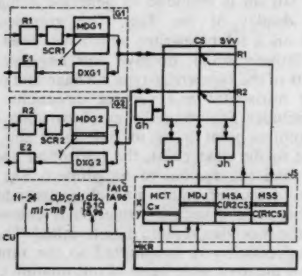
Alternate apparatus and methods are disclosed for further reduction of the transmission of invariable information and for suppressing the printing of symbols which contain graphing information.

3,609,668

PATH SEARCH CIRCUIT

Jacques Georges Dupieux, Issy-les-Moulineaux; Bernard Pierre Jean Durteste, Sevres; Francis Emmanual Jean Robert, Boulogne-Billancourt, France, and Jean-Pierre Le Corre, deceased, late of Sainte-Genevieve-des-Bois, France (by Yvette Marie Laurence Le Corre, administrator), assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 5, 1970, Ser. No. 022,105
Claims priority, application France, Mar. 6, 1969, 6906194
Int. Cl. H04m *7/00*
U.S. Cl. 340—172.5 **6 Claims**



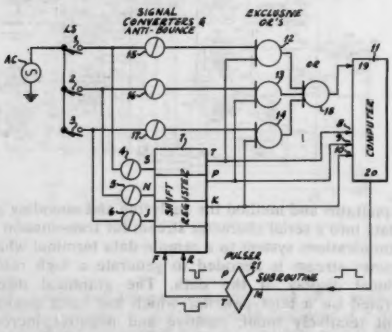
Scanning and path search circuits are provided in a switching exchange involving time division multiplex data and more particularly in an exchange employing pulse code modulation.

3,609,669

VARIABLE INFORMATION INPUT SYSTEM

Carl J. Weiss, New Berlin, and Gilbert W. Wierschke, Milwaukee, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Apr. 8, 1970, Ser. No. 26,501
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **5 Claims**



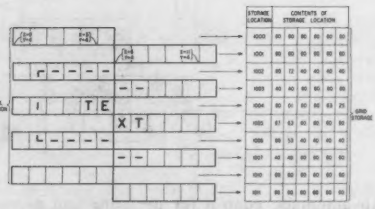
An input system for a computer that detects when there has been a change in process information and signals the computer to pulse a shift register to the new information setting whereby the new process information is put into the computer as soon as it occurs.

3,609,670

PROGRAM CONTROLLED SYSTEM FOR PROCESSING SPATIALLY DISTRIBUTED INFORMATION

Kenneth C. Knowlton, Plainfield, N.J., assignor to Bell Telephone Laboratories, Inc., New York, N.Y.

Continuation of application Ser. No. 449,854, Apr. 21, 1965, now abandoned. This application May 20, 1970, Ser. No. 37,486
Int. Cl. G06f *7/00*
U.S. Cl. 340—172.5 **3 Claims**



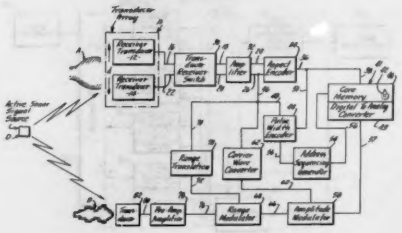
A computer program is disclosed by means of which graphical information can be directly represented in coded form in the internal memory of the computer. Subroutines are provided for testing, changing and writing graphical symbols in coded form in the computer by means of scanners identifying unique plotting points of the internally represented graphical grid.

3,609,671

ACTIVE SUBMARINE TARGET ECHO SYNTHESIZER

Richard B. Webster, Winter Park, and Michael T. Marrero, Casselberry, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy

Filed Mar. 23, 1970, Ser. No. 21,899
Int. Cl. G01s *9/66;* **G09b** *9/00*
U.S. Cl. 340—3 E **6 Claims**



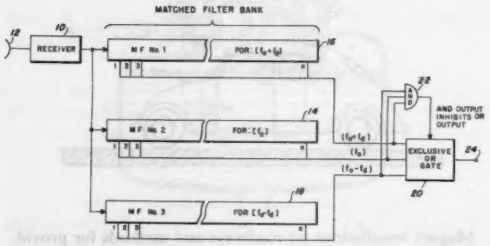
Apparatus wherein an active incoming sonar signal is synthesized by means including a spaced array of receiver transducers to provide a carrier frequency and a digital signal, said digital signal being applied to address a memory means including a core memory in which submarine signatures are stored for retrieval in relation to the type of submarine and aspect angle thereof and which also includes a digital to analog converter means. The outputs of said analog converter means being applied to modulate a carrier wave signal derived from a tone burst to carrier wave converter and further modulated by range data from a range translator to activate transducer means to provide a reflected sub-

marine target sonar signal representative of a selected type submarine at an aspect angle and range corresponding to said incoming active sonar signal.

3,609,672
FALSE ALARM INHIBIT CIRCUIT IN ECHO RANGING SYSTEMS

Lewis H. Bossert, El Cajon, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 28, 1969, Ser. No. 845,444
Int. Cl. G01s 9/66
U.S. Cl. 340—3 R **3 Claims**

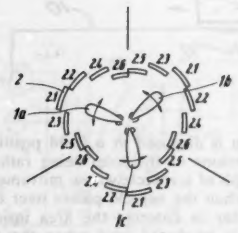


Two or more filters with narrow side-by-side passbands will each pass broadband noise voltages but only one filter can pass a useful narrowband signal. An exclusive OR gate will pass a single filter output but will block simultaneous noise outputs thus effectively distinguishing between useful signals and false alarms.

3,609,673
SONAR SCANNING METHOD

Dietrich Muller, Achim, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter, Haftung Essen, Germany

Filed July 16, 1969, Ser. No. 842,112
Int. Cl. G01s 9/66
U.S. Cl. 340—3 R **2 Claims**

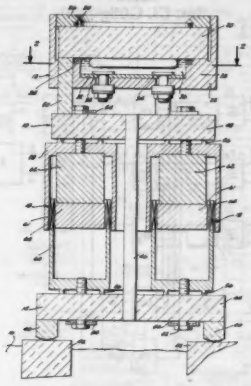


The invention concerns a sonar installation the transmitting device of which is switchable for the transmission of sounding pulses successively in different directions, within a circular sector of angular extent n according to the direction sequence $(n/2)$, $(n/2)+1$, $(n/2)-1$, $(n/2)+2$ ...where $(n/2)$ is the approximate center of the circular sector, the + and − signs denote directions on either side of the $(n/2)$ direction, and the integers 1, 2, etc. represent units of angular displacement.

3,609,674
SEISMOMETER

Siegfried Hansen, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of application Ser. No. 675,491, Oct. 16, 1967. This application Oct. 21, 1969, Ser. No. 868,143
Int. Cl. G01v 1/16
U.S. Cl. 340—17 **6 Claims**

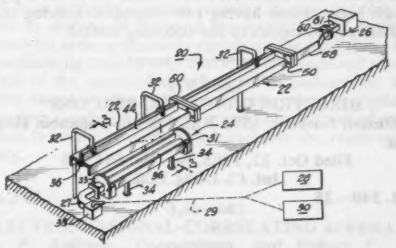


The seismometer has motion-sensing means and recentering means for recentering the seismic mass to a zero position. It employs displacement sensors, preferably in two coordinates, to emit an output signal upon seismic mass motion. The displacement signal serves as an output signal, and, in addition, is fed back to the seismic mass centering means for optimum damping and recentering. The feedback through three channels of functionally different characteristics provides optimum feedback for broadband sensitivity and response.

3,609,675
MICROWAVE COMMUNICATION SYSTEM FOR MOVING LAND VEHICLE

Manlio G. Abele, Garden City, N.Y., assignor to General Applied Science Laboratories, Inc., Westbury, N.Y.

Filed Mar. 3, 1969, Ser. No. 803,621
Int. Cl. H04b 3/60
U.S. Cl. 340—22 **24 Claims**



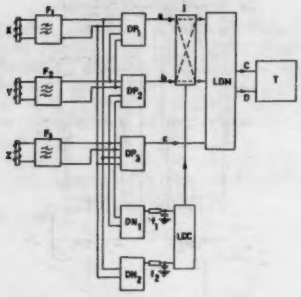
The microwave communication system, in its preferred form, includes a stationary waveguide through which microwave energy flows in surface waves in the fundamental mode. The waveguide preferably is a semicylindrical dielectric rod with a metallic conducting shield on the flat surface of the rod, and with the remainder of the rod unshielded. An antenna having the same general guide configuration is positioned near the waveguide to transmit and receive communications to and from the waveguide. The antenna either is stationary or is mounted on a vehicle such as a railroad car and positioned so as to always be near the waveguide. One form of antenna actually comprises a novel directional coupler, and another is a resonant antenna. In the waveguide fabrication method, the pattern of the lines of force of the electrical field in an unshielded waveguide of a given shape is determined, and a plane perpendicular to the lines is located. A waveguide is formed with the original shape but cut away along the perpendicular plane. Then a conductive shield is located at the resulting surface.

3,609,676

DEVICE FOR DETECTING THE POSITION OF A RAILWAY VEHICLE ON A TRACK

Christian Jauquet, Charleroi, and Joseph Claes, Serclaes de Tilly, both of Belgium, assignors to Ateliers de Constructions Electriques de Charleroi (ACEC), Charleroi, Belgium

Filed Aug. 27, 1969, Ser. No. 853,346
Claims priority, application Belgium, Aug. 30, 1968, 62,837
Int. Cl. G08g 1/00
U.S. Cl. 340—23 2 Claims



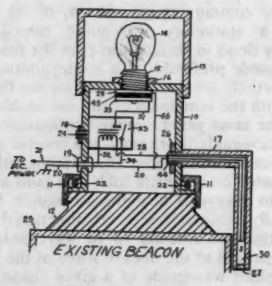
A device for detecting the position of a train on a railway track equipped with a centralized control over the travel of the train using a transmission cable having crossings or other means defining periodic phase inversions of the magnetic field of the cable. It comprises three antennas located underneath the floor of the locomotive of the train and aligned one after the other in the longitudinal direction of the track, a band-pass filter connected to each antenna, three phase detectors, each one having two inputs connected to the outputs of two of the band-pass filters in accordance with the three different possibilities, such phase detectors being arranged to deliver an output signal only when their input voltages are in phase opposition, a logic circuit having three inputs connected respectively to the outputs of the three phase detectors for detecting the direction of travel of the train, and a summing circuit for totalizing the number of marking points crossed by the train connected to the outputs of the logic circuit, such logic circuit having two outputs delivering counting and deduction signals to the summing circuit.

3,609,677

DIRECTION INDICATING BEACONS

Gayle Russell Norberg, 4522 N.E. 7th St., Columbia Heights, Minn.

Filed Oct. 22, 1965, Ser. No. 504,290
Int. Cl. G08g 5/00
U.S. Cl. 340—25 16 Claims



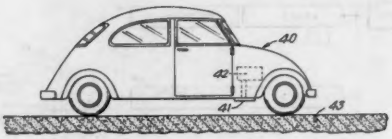
A new way is disclosed for generating azimuth-dependent time intervals between flashes or signals from rotating beacons employing directable radiation. An omnidirectional index flash is generated each time the beacon rotates past a fixed point. Resulting flash patterns convey to any observer his azimuth about the beacon. Apparatus is described to adapt existing beacons or new designs to produce the intervals automatically.

3,609,678

MAGNETIZED MEANS FOR PROVIDING CONTROL INFORMATION TO MOVING VEHICLES

Richard E. Fayling, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 28, 1969, Ser. No. 819,836
Int. Cl. G08g 1/09; E01f 11/00
U.S. Cl. 340—32 15 Claims



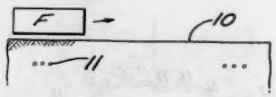
Magnet installations on roadways and methods for providing control information to vehicles traveling on the roadways. The magnets are polymer-based magnets, which comprise a tough organic polymeric matrix and particles of magnetic material uniformly distributed through the matrix. The magnets are often installed in the form of a sheet or tape in a channel formed in the roadway surface, and are arranged in geometries or magnetized in patterns to develop information-providing signals in magnetic-flux-sensors in vehicles traveling over the magnets.

3,609,679

EARTH FIELD VEHICLE DETECTOR

Robert E. Updegraff, Huntington Beach, and Robert F. D'Ausilio, La Mirada, both of Calif., assignors to Threshold Engineering, Inc., Fullerton, Calif.

Filed Jan. 12, 1970, Ser. No. 4,472
Int. Cl. G08g 1/01
U.S. Cl. 340—38 L 10 Claims



A sensing loop is disposed in a fixed position relative to earth, the dimensions of the loop being rather large compared to the length of a vehicle whose movement is to be detected, so that when the vehicle passes over one portion of the loop perimeter in entering the area inside the loop a signal response is produced, and when the vehicle passes over another portion of the perimeter in leaving the loop area another separate response is created. The loop has a low impedance and consists of a small number of conductor turns, typically three or less. For convenience the loop is typically buried beneath the surface of the roadway.

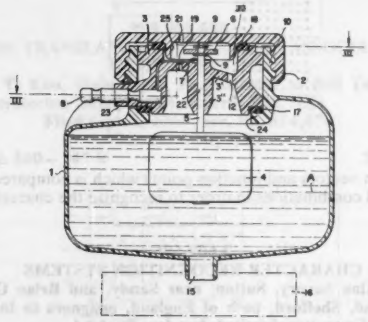
Output pulses from the loop are supplied to a signal processing unit, which amplifies and integrates the pulses so as to exclude all frequencies higher than about 10 Hertz, and at the same time provide an output signal whose amplitude is substantially independent of the vehicle's speed. The processor includes a threshold-responsive trigger circuit which is capable of responding to a signal of sufficient amplitude and of either polarity. An output circuit is actuated by the trigger circuit.

3,609,680

BRAKE FLUID RESERVOIR

Juan Belart, Walldorf, Germany, assignor to Alfred Teves GmbH, Frankfurt/Main, Germany

Filed May 3, 1968, Ser. No. 726,359
Claims priority, application Germany, May 5, 1967, T 33798 II/63c
Int. Cl. B60t 17/22
U.S. Cl. 340—59 8 Claims



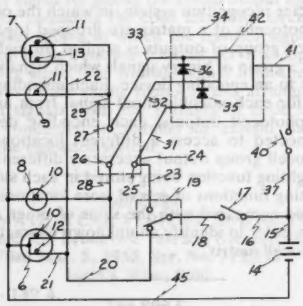
A brake fluid reservoir with an alarm switch for signaling an insufficient fluid level in its interior. The mechanism is mounted in an insert in one neck of a filler opening of the reservoir, the connections between the alarm and the switch mechanism being led laterally out through a projection of the insert passing through the side of the neck; the insert is provided with a hole through which brake fluid can be poured.

3,609,681

CONTROL CIRCUIT FOR ALTERNATELY FLASHING AUTOMOBILE HEADLAMPS

John R. Saul, 1301 Cochise, Arlington, Tex.

Filed May 22, 1969, Ser. No. 826,792
Int. Cl. B60q 1/46
U.S. Cl. 340—76 4 Claims



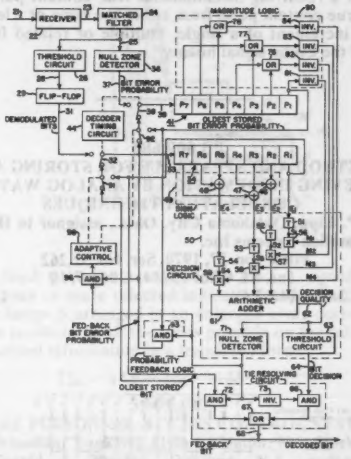
A control circuit for the headlamps of a vehicle includes the conventional switches for high beam and low beam control; and includes an additional circuit for effecting alternate blinking or flashing of the high beam lamps or filaments with override for continuous illumination by the high beam lamps or filaments when desired.

3,609,682

AUGMENTED DIGITAL-ERROR-CORRECTING DECODER

Michael E. Mitchell, Syracuse, N.Y., assignor to General Electric Company

Filed July 16, 1969, Ser. No. 842,289
Int. Cl. G08c 25/00; H04l 1/10
U.S. Cl. 340—146.1 12 Claims



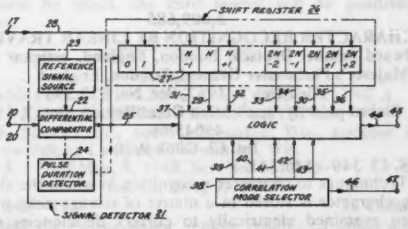
An error correcting decoder circuit for decoding redundantly coded received digital signals. Estimator bits are generated from selected bits of a received code word, and estimator reliability signals are generated in accordance with word-bit error probability signals derived from the received analog signal amplitudes associated with the same selected bits of the code word as are used for generating the estimator bits. The estimator reliability signals are used as a basis for weighting the bipolar estimator bit voltages, by increasing or decreasing their absolute values, whereby the more reliable estimator bits are given greater weights at the input of a threshold decision circuit. The threshold decision circuit generates an output bit in accordance with the arithmetic sum of the weighted estimator bit voltages, except that it substitutes the appropriate received bit in place of the unreliable threshold decision that arises in the event that the sum is small in magnitude. Control circuitry is provided for causing repetitive shifting of the word bits in a first shift register and of word-bit error probability signals in a second shift register, for performing step-by-step decoding of a received word with the aid of the received signal reliability indications. The invention thus provides a means of augmenting the digital error correction capability of decoders through the use of auxiliary outputs from the receiver which indicate the received signal quality.

3,609,683

ELECTRONIC-SIGNAL-CORRELATING APPARATUS

John P. Hoffman, Coopersburg, and Robert C. Booth, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation

Filed Apr. 16, 1969, Ser. No. 816,709
Int. Cl. G06f 7/04; H03k 5/20
U.S. Cl. 340—146.2 10 Claims



Electronic correlator improves the apparent signal-to-noise ratio of any variable cyclic signal having recurrable true and

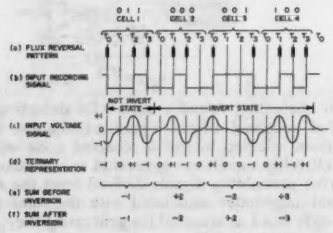
random false signal content including noise. This arrangement enables signal-producing sources, such as scanning defect-detecting probes in nondestructive test apparatus, to be operated at unusually high levels of sensitivity. The correlator includes an analog signal detector, tapped shift register, logic and correlating mode selection circuits which operate to separate and pass true content pulses and reject all other signals. Correlation takes place whenever coincidence occurs between a recurring instantaneous true content pulse and a stored true content pulse from either the same or a leading or lagging increment of a single, multiple or related fractional cycle of the cyclic signal history.

3,609,684

METHOD AND APPARATUS FOR STORING AND RETRIEVING INFORMATION BY ANALOG WAVEFORM CORRELATION TECHNIQUES

James P. Lipp, Oklahoma City, Okla., assignor to Honeywell Information Systems Inc.

Filed Apr. 27, 1970, Ser. No. 32,262
Int. Cl. G06f *15/34*; G06g *7/19*
U.S. Cl. 340—146.3 C **18 Claims**


0 1 1 CELL 1
0 0 0 CELL 2
0 0 1 CELL 3
1 0 0 CELL 4
(a) FLUX REVERSAL PATTERN
(b) INPUT RECORDING SIGNAL
NOT INVERT STATE
INVERT STATE
(c) INPUT VOLTAGE SIGNAL
(d) TERNARY REPRESENTATION
(e) SUM BEFORE INVERSION
(f) SUM AFTER INVERSION

A high-density storage and retrieval system is disclosed in which information is divided into a succession of groups of binary digits and stored as patterns of representations in an associated plurality of storage cells in a record medium. Upon scanning each recorded pattern of representations, a transducer generates an electrical signal having one discrete analog waveform uniquely corresponding to each of the recorded patterns of representations. A set of sample signals is then generated by sampling each discrete analog waveform at critical points. Each such set of sample signals is summed by correlation techniques requiring the adding and subtracting of the various individual sample signals to generate a sum signal. The magnitude of the sum signal is correlated to, or related with, a reference magnitude which is representative of a sum signal corresponding to a known analog waveform. As a result of this correlation, the magnitude of each sum signal is recognized as being indicative of a particular group of binary digits. The use of correlation techniques allows for the cancellation and averaging of analog waveform imperfections, and results in a sum signal which more accurately corresponds to the analog waveform detected.

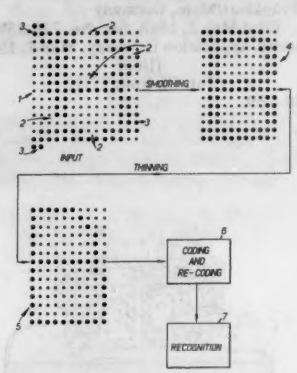
3,609,685

CHARACTER RECOGNITION BY LINEAR TRAVERSE

Edward Samuel Deutsch, London, England, assignor to Her Majesty's Postmaster General, London, England

Filed Oct. 3, 1967, Ser. No. 672,598
Claims priority, application Great Britain, Oct. 7, 1966, 45045/66
Int. Cl. G06k *9/10*
U.S. Cl. 340—146.3AE **3 Claims**

Techniques to character recognition in which the shape of the character is stored in a matrix of storage cells which is then examined electrically to correct deficiencies not inherent in the character and to "thin" the stored shape to a required extent. The store shape is then examined again and converted to a characteristic combination of numbered direction vectors and junction points which is compared with standard combinations in order to recognize the character.

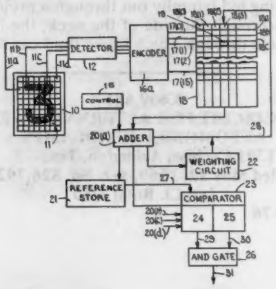


3,609,686

CHARACTER RECOGNITION SYSTEMS

Derek Alan Savory, Sutton, near Sandy, and Brian George Holland, Shefford, both of England, assignors to International Computers Limited, London, England

Filed July 9, 1969, Ser. No. 840,319
Claims priority, application Great Britain, July 15, 1968, 33,564/68
Int. Cl. G06k *9/10*
U.S. Cl. 340—146.3 T **8 Claims**



A character recognition system, in which the outputs of individual photocells of a matrix are grouped together, is disclosed, Each group of outputs is applied through a detector to produce a group of binary signals which signals are applied as an input to an encoding device. Each encoding device has an output for each possible input signal from an associated group of photocell outputs, each encoding device output being connected to access a different location in a store. Each photocell group output accesses a different store location, a weighting function being stored in each store location. The weighting functions of sets of store locations in a set are summed and compared with the sums of other sets of store locations in order to identify an unknown character displayed to the photocell matrix.

3,609,687

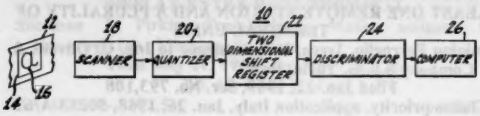
PATTERN RECOGNIZER

Ivan H. Sublette, Princeton Junction, N.J., assignor to RCA Corporation

Filed Oct. 31, 1968, Ser. No. 772,275
Int. Cl. G06k *9/06*
U.S. Cl. 340—146.3 R **5 Claims**

A pattern recognizer recognizes an unknown pattern by hypothesizing the identity of the unknown pattern and then

testing to see whether the identification can be refuted. An identification that cannot be refuted is the correct identification of the unknown pattern.

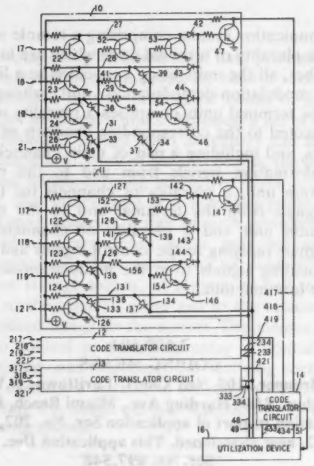


3,609,688

CODE TRANSLATOR FOR USE IN AN ASSOCIATIVE MEMORY SYSTEM

James T. Koo, Walnutport, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 3, 1969, Ser. No. 854,874
Int. Cl. H04q 9/00
U.S. Cl. 340—147 R **7 Claims**



A diode code translator circuit is described in which inhibiting transistors are driven by coded output signals to inhibit concurrent input signals in a predetermined priority pattern. The uninhibited input signals drive an OR gate to provide a transfer signal for gating the coded output signals.

A system for cascading the code translator circuits of this invention is also shown in which the transfer signals from a plurality of the code translator circuits serve as input signals to a succeeding stage. The transfer signal from the succeeding stage serves as the gating signal. In this arrangement, the coded output signals from the plurality of code translation circuits are connected in parallel to extend the priority sequence to the cascaded system.

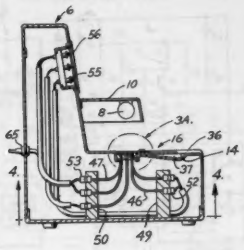
3,609,689

INFORMATION CAR VERIFIER AND METHOD

David Shulman, 750 Brookvale Terrace, Glencoe, Ill.

Filed Mar. 8, 1968, Ser. No. 711,729
Int. Cl. H04q 9/00
U.S. Cl. 340—149 A **2 Claims**

An information card verifier and method of verification wherein a plate is provided having a plurality of passages through its thickness, the passages being of a predetermined number and position corresponding to the number and position of all the possible code information holes on the information card. A light source illuminates one side of the plate and the light which passes through each of the passages is conducted to a plurality of photoelectric cells through a plurality of optical fiber light guides which are inserted in each of the passages. When the coded portion of the information card which is to be verified is disposed in a predetermined position between the light source and the passages, the light passing through selected ones of the passages is blocked by the absence of a hole in a possible hole position. Each of the individual photoelectric cells corresponding with the each of



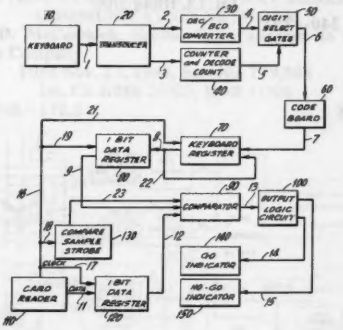
the darkened passages consequently emit a signal which energizes one or more selected indicator lamps. Each of the indicator lamps is arranged in an enlarged array corresponding to the positions of all the holes possible on the tab to display the coded information in a translated form.

3,609,690

SECURE PERSONNEL ACCESS CONTROL SYSTEM

Irwin J. Nissman, Yonkers; Alvin Goldman, New York, N.Y., and Gerald A. Pruden, Oakland, N.J., assignors to Holobeam, Inc., Paramus, N.J.

Filed Oct. 17, 1969, Ser. No. 867,192
Int. Cl. H04q 9/00
U.S. Cl. 340—149 R **4 Claims**



A system for identifying the bearer of an identification card wherein cryptographically encoded information on the card is compared to a randomly scrambled representation of a number privately known to the card bearer. Comparison is made by insertion of the identification card into a card-reading means, and by insertion of the privately known number into a number-receiving means, whereby the two numbers may be sent to a comparator on a digit basis. Should the comparison be exact, the card holder will be positively identified.

3,609,691

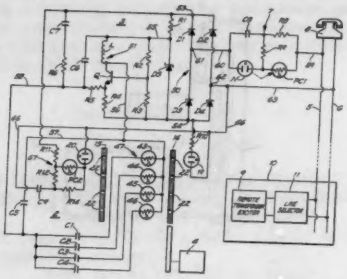
MEANS FOR ACTIVATING AND CONTROLLING A REMOTE METER READING SYSTEM

Victor E. Stewart, Jr., South Milwaukee, Wis., assignor to McGraw-Edison Company, Milwaukee, Wis.

Filed Mar. 8, 1968, Ser. No. 711,705
Int. Cl. H04q 9/10
U.S. Cl. 340—151 **12 Claims**

A system for the automatic remote reading of utility meters including a position encoder and transponder having a plurality of position coding means coupled to the meter being

read and oscillator means for generating tones in accordance with the positions of the respective position coding means. A centrally located remote transponder exciter provides a voltage signal for energizing the transponder and for controlling circuit means in said transponder to thereby control the order of operation of the position coding means and oscillator means.

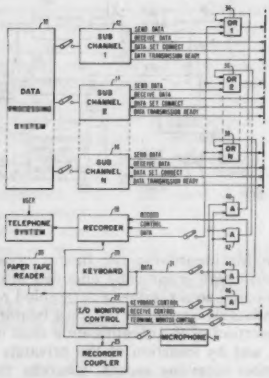


3,609,692

COMMUNICATIONS MONITOR FOR DATA PROCESSING SYSTEM

Robert M. Blake, Wappingers Falls, and Robert P. Dingwall, Mahopac, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 22, 1968, Ser. No. 769,654
Int. Cl. H04q *5/00*
U.S. Cl. 340—152 **5 Claims**



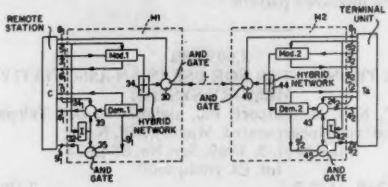
A monitoring arrangement for enabling communication between a data processing system and remote users thereof in which there are included means for enabling communication between an operator and the system to permit examination of the data being sent by the system, means for enabling communication between remote users and the system to permit examination of the data being sent by the users to the system and means for alternately consecutively enabling the system information and the user information to be observed to effectively achieve bidirectional intercommunication between the system and the users. The arrangement is capable of operating in both the audio and digital modes.

3,609,693

DATA COMMUNICATION SYSTEM COMPRISING AT LEAST ONE REMOTE STATION AND A PLURALITY OF TERMINAL UNITS

Luigino Ferroglio, Ivrea, Italy, assignor to Ing. C. Olivetti & Company S.p.A., Turin, Italy

Filed Jan. 22, 1969, Ser. No. 793,108
Claims priority, application Italy, Jan. 26, 1968, 50283-A/67
Int. Cl. H04j *3/06*; H04q *5/00*
U.S. Cl. 340—152 **2 Claims**



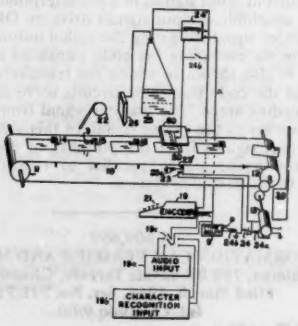
A communication system comprising a remote station connected to a plurality of terminal units which are located close to each other, all the units being connected to a line through a single modulation-demodulation unit whose interface towards the terminal units comprises a plurality of channels, each connected to the corresponding channels of all the terminal units, and including a pair of main channels for transmitting information signals from and to the modulation-demodulation unit, a plurality of channels for transmitting control signals from the terminal unit to the modulation-demodulation unit and a plurality of channels for transmitting signals replying to the control signals and other condition indicating signals from the modulation-demodulation unit to the terminal unit.

3,609,694

CODING MEANS

William Brenner, 105 Neil Court, Levittown, N.Y., and Sidney Koslow, 8440 Harding Ave., Miami Beach, Fla.

Continuation-in-part of application Ser. No. 202,306, June 13, 1962, now abandoned. This application Dec. 20, 1967, Ser. No. 697,548
Int. Cl. G11c *11/00*
U.S. Cl. 340—172.5 **9 Claims**

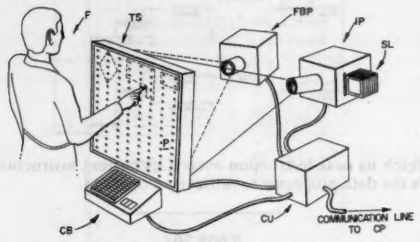


Apparatus for electrically coding discrete opaque articles of variable size of the type having a piece of electrically responsive material placed in a predetermined space relation to at least one side of said article, comprising an electric recording head, means to move said article into operative electrical engagement between said recording head and said material, and information input means connected to said head.

3,609,695
DISPLAY-ENTRY DATA TERMINAL

Sherman J. Pirkle, Framingham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 10, 1968, Ser. No. 728,274
Int. Cl. G06f *3/14*
U.S. Cl. 340—172.5 6 Claims

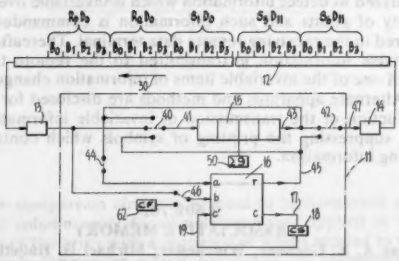


A data display-entry terminal for a data processing system wherein a selected image is projected onto a viewing screen which is enclosed by two orthogonal banks of light beam-photodetector units, each unit comprising a set of source-detector combinations spaced apart in registry and arranged to project an associated array of parallel beams, the intersection of orthogonal beams defining respective index points on the screen such that interjection of a selection probe etc. at an index point may interrupt a pair of such coordinate beams. This coincident beam interruption may be adapted to generate positional select signals to be entered in an associated data storage means, at a memory cell therein corresponding to the selected point and to the selected portion of the associated image on the screen. The memory matrix is organized to control an associated array of optical feedback signals projected onto this screen for verifying each selection and, at the operator's option, to transmit an encoded pulse train indicating the image portion selection to an associated data processing system.

3,609,696
PROGRAMMED ARRANGEMENT FOR SERIAL HANDLING OF NUMERICAL INFORMATION

Jan Doting, Nijmegen, Netherlands, assignor to The Singer Company

Filed Sept. 6, 1968, Ser. No. 757,860
Int. Cl. G06f *13/02*
U.S. Cl. 340—172.5 4 Claims

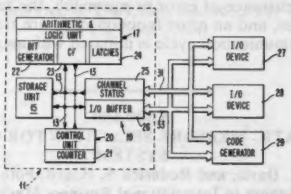


A data handling system having a dynamic delay line data signal storage means selectively coupled with a static storage register or an add-subtract unit for adding or subtracting, algebraically, one set of data signals to a second set of data signals.

3,609,697
PROGRAM SECURITY DEVICE

Parker R. Blevins, Austin; David W. Terry, Georgetown, and Ray H. Thurmond, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1968, Ser. No. 769,149
Int. Cl. G06f *11/04*
U.S. Cl. 340—172.5 2 Claims

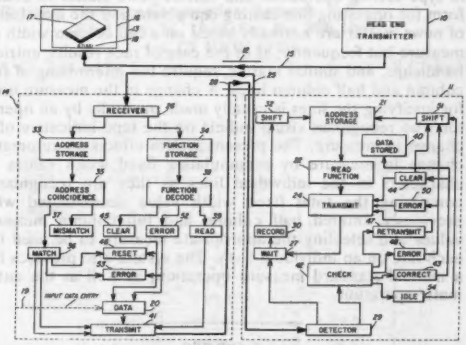


A program security device and method for a digital computer including a code generating circuit for providing a unique and predetermined output code to the digital computer for periodic comparison with identification information located within the stored program of the computer. If the identification information does not coincide with the output code, a jump operation is performed and certain portions of the stored program are changed in order to prevent the execution of the program. The output code can be utilized as a mask source for the program and/or a regenerative program routine can be utilized in order to prevent simple evasion of the routine.

3,609,698
CONTROL STATION FOR TWO-WAY ADDRESS COMMUNICATION NETWORK

Edward D. McCormick, Scotia, N.Y., assignor to General Electric Company

Filed Nov. 27, 1968, Ser. No. 779,568
Int. Cl. G08b *29/00*; H04l *11/06*
U.S. Cl. 340—172.5 8 Claims



A communication network comprising a central station and a plurality of communication response units establishes communication therebetween when the central station transmits a reset pulse followed by a particular unit address and an interrogating code (read function code) to the response units. This initiates a "communication cycle" during which the central station communicates with a particular response unit. Each response unit has storage elements which are set in a ready-to-receive state by the reset pulse. The addressed response unit responds with either a data signal carrying the unit address and data information for the central station or an idle signal carrying the unit address and indicating no data. The central station includes an element which is able to distinguish between the two signals. Upon receiving a data

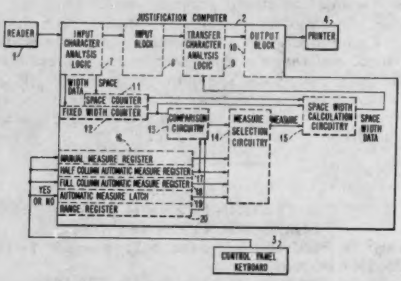
signal from the response unit, the central station checks the received signal for correctness and clears that response unit by transmitting an initial reset pulse followed by the same unit address and a clear function code which empties the addressed unit of the data stored therein. When the idle signal is received, the central station simply initiates another communication cycle with another response unit. When the central station determines that there is an error in transmission or a mismatch between the transmitted and received unit address, the reset pulse, unit address, and read function code are retransmitted to the same response unit. When there is a second occurrence of error or mismatch, the reset pulse, the unit address, and an error function code are transmitted and a new communication cycle is initiated with another response unit.

3,609,699

AUTOMATIC MEASURE SELECTION FOR COMPOSER SYSTEM

William H. Davis, and Roderick S. Heard, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1968, Ser. No. 724,990
Int. Cl. B41b *3/06*
U.S. Cl. 340—172.5 **15 Claims**



The invention relates to an automatic measure selection feature for a composing system having a paper tape input and a printer output. The paper tape is the type commonly used in type setting operations and carries news matter in coded form for operating line casting equipment and the like. Lines of news matter are normally based on a full column width or measure but frequently, as in the case of race results, entries, handicaps, and similar matter, require the intermixing of full column and half column lines. A change in the measure used for justifying the lines is usually made manually by an operator who recognizes visual indicia on the tape indicative of a change in measure. The present system effects an automatic change in measure by accumulating fixed width values of characters in the individual lines as they are recognized, comparing the total fixed width value accumulated with previously entered half column and full column measure values and selecting the appropriate measure to be used for each line on an individual basis. The system also provides for a manual standard measure operation, as well as the automatic operation.

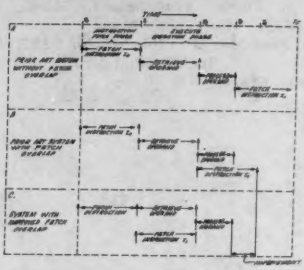
3,609,700

DATA PROCESSING SYSTEM HAVING AN IMPROVED FETCH OVERLAP FEATURE

James E. Wollum, Glendora, and Richard S. Sharp, Sierra Madre, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 24, 1970, Ser. No. 14,169
Int. Cl. G11c *7/00*; G06f *9/00*
U.S. Cl. 340—172.5 **14 Claims**

An improvement in a fetch overlap feature for a data processing system results from providing multiple interfaces between the system data processor and the system memory. The memory is divided into a plurality of independent units each having its own interface. The data processor can retrieve more than one word from the memory system at the same time without incurring contention between memory access orders. The data processor is thereby enabled to begin



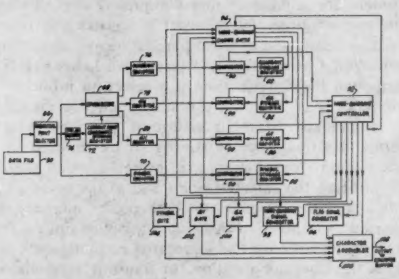
to fetch its next instruction even if its current instruction orders the data processor to retrieve an operand.

3,609,701

DATA TERMINAL SYSTEM

Allan L. Budd, San Diego, Calif., assignor to Typagraph Corporation, San Diego, Calif.

Filed Mar. 18, 1970, Ser. No. 20,560
Int. Cl. G06f *3/12*
U.S. Cl. 340—172.5 **2 Claims**



Apparatus and method for analyzing and encoding graphical data into a serial character stream for transmission over a communications system to a remote data terminal where the character stream is decoded to generate a high resolution graphical display of the data. The graphical display is generated on a teletypewriter which has been modified to permit relatively small, positive and negative incremental movements of the typewriter type carriage and platen in their respective horizontal and vertical directions. The coding scheme include analyzing the graphical data on an incremental point-to-point basis to determine the quadrant of movement to the next point, the horizontal and vertical increments, and the symbol to be printed. The data is also analyzed to detect information which is invariable over a plurality of points and such information is commanded to be stored in the receiving remote data terminal. Thereafter, only variable information is transmitted to the remote terminal until one of the invariable items of information changes.

Alternate apparatus and methods are disclosed for further reduction of the transmission of invariable information and for suppressing the printing of symbols which contain graphing information.

3,609,702

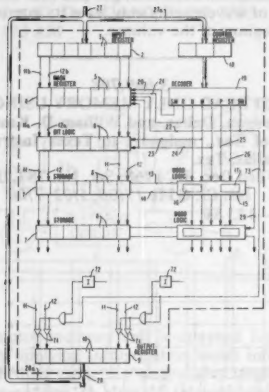
ASSOCIATIVE MEMORY

Peter A. E. Gardner, Winchester; Michael H. Hallett, Chandlers Ford, and Peter J. Titman, Winchester, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1968, Ser. No. 825,455
Int. Cl. G11c *15/00*
U.S. Cl. 340—172.5 **8 Claims**

This invention relates to an associative memory for the storage of digital data in which each word location of the

memory is provided with two or more match triggers. Mans is provided for registering matches or mismatches in a selected



trigger and for controlling operations on the memory in response to the contents of a selected trigger. Several operations are described which use the plural triggers.

3,609,703

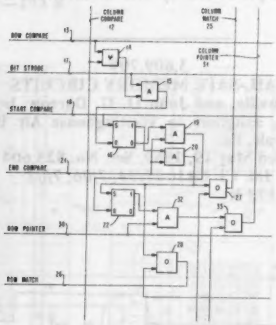
COMPARISON MATRIX

Antony Peacock, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,636

Int. Cl. G06f 7/22

U.S. Cl. 340—172.5 **5 Claims**



A new comparison circuit is adapted to be connected in a row and column array for comparing words applied to the columns of the array with a sequence of words applied to the rows. Each comparison circuit has means for registering a match or a mismatch while corresponding bit positions of the words that are being compared are applied to the column input and the row input of the circuit. A comparison circuit includes means responsive to a match to transmit data from a row input to a column output.

The specification describes the circuit as it is arranged to compare key words to a file index with key words supplied by a user of the file and to transmit a data word called a pointer to the user to identify the file location when a match is found.

3,609,704

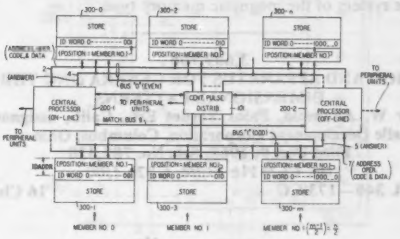
MEMORY MAINTENANCE ARRANGEMENT FOR RECOGNIZING AND ISOLATING A BABBLING STORE IN A MULTIST ORE DATA PROCESSING SYSTEM

Werner H. Schurter, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 6, 1969, Ser. No. 863,894

Int. Cl. G06f 11/00

U.S. Cl. 340—172.5 **7 Claims**



A data processing system wherein the central processors are duplicated and are associated with a group of duplicated memory storage units over a set of duplicated communications buses is disclosed. Each memory unit is identified by a unique name code as well as a unique identification word stored in the memory unit independently of the name code. After a particular memory unit is addressed, the identification word received by the central processor in response thereto is analyzed for determining and isolating any babbling store which spuriously responds to the addressing of the desired memory unit.

3,609,705

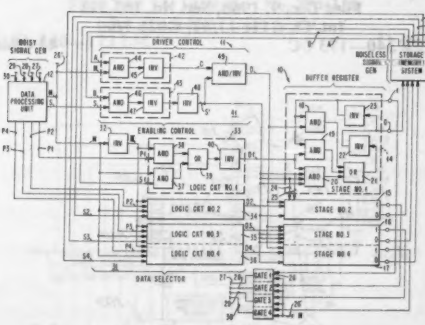
MULTIVIBRATOR RESPONSIVE TO NOISY AND NOISELESS SIGNALS

Brian R. Mercy, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,106

Int. Cl. H03k 19/00

U.S. Cl. 340—172.5 **9 Claims**



A multivibrator is provided with a control circuit that generates control signals having a first characteristic which sets and latches simultaneously the output signal of the multivibrator to a binary state that is indicative of the binary state of a noisy input signal at the termination of a first time period. The control circuit also generates the control signals with a second characteristic that sets the output signal of the multivibrator to a binary state which is indicative of the bi-

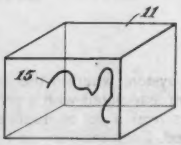
nary state of a noiseless input signal that is applied during a predetermined time interval and thereafter latches the output signal to the binary state to which the output signal was set during the time interval. The first time period is selected to be equal at least to the time duration of the noise time characteristic of the noisy signals thereby allowing the noisy signal to be stored in the multivibrator only after the input signal has reached the binary level which is to be stored. The length of the time interval is selected to allow the setting of the multivibrator at any time within the time interval regardless of the time of arrival, i.e. of application, of the noiseless signal during the time interval. Also, a system in which the multivibrator and control circuit is used for commonly storing signals from a noisy signal source such as a data processing unit and a noisy signal source such as a storage system of the magnetic memory type.

3,609,706

METHOD AND APPARATUS FOR GENERATING THREE-DIMENSIONAL PATTERNS

Arthur W. Adamson, Palos Verdes Est., Calif., assignor to Battelle Development Corporation, Columbus, Ohio

Filed Dec. 9, 1968, Ser. No. 782,320
Int. Cl. G11c *13/04*; G02b *1/00*
U.S. Cl. 340—173 CC **16 Claims**



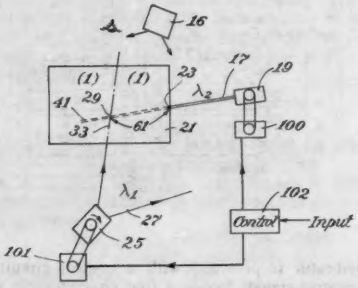
Method and apparatus for generating patterns in a three-dimensional volume of material having at least two discernible nonradiation emissive states and responsive to a selected level of radiant energy, such as heat or light, to pass between the discernible states. External radiation sources with distinct wavelength ranges are utilized to cause the material to pass from one discernible state to another in preselected regions of the volume.

3,609,707

METHOD AND APPARATUS FOR GENERATING THREE-DIMENSIONAL PATTERNS

Jordan D. Lewis, Worthington, and Albert H. Adelman, Columbus, both of Ohio, assignors to Battelle Development Corporation, Columbus, Ohio

Filed Dec. 9, 1968, Ser. No. 782,321
Int. Cl. G11c *13/04*; G02b *1/00*
U.S. Cl. 340—173 CC **43 Claims**



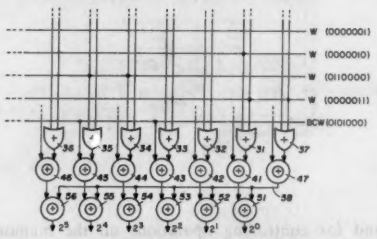
Method and apparatus for generating patterns in a three-dimensional volume of material having at least two discernible nonradiation emissive states and responsive to a selected level of radiant energy, such as heat or light, to pass between the discernible states. According to one aspect of the invention, external radiation sources with distinct wavelength ranges are utilized to cause the material to pass from one discernible state to another in preselected regions of the volume. According to another aspect of the invention, materials used have a sharp threshold between their two discernible states wherein a single external radiation source of one range of wavelengths may have its intensity focused in preselected regions of the volume.

3,609,708

OPTIMIZED READ ONLY MEMORY USING TAG BITS

Harvey G. Cragon, Dallas, and William D. Kastner, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1968, Ser. No. 787,785
Int. Cl. G11c *17/00*, *5/02*, *7/00*
U.S. Cl. 340—173 SP **7 Claims**



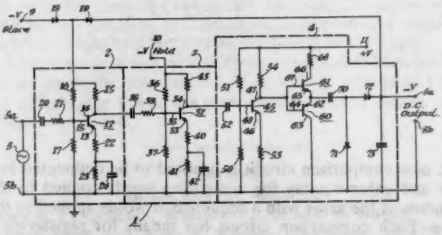
Word length limitations on "read only" memories due to limited driving capability of a single word driver and the limitations upon the number of words which can be stored due to the limited number of inputs to OR gates at the memory output are minimized by complementing each row in the memory matrix and each column in the memory matrix when the number of ones in a given row or column is greater than one-half the number of bits in the row or column respectively and storing a first set of tag bits representative of the rows complemented and the second set of tag bits representative of the columns complemented. Means are provided for reading from the sets of tag bits when reading data represented by bits in the memory rows and columns.

3,609,709

FAIL-SAFE MEMORY CIRCUITS

Walter W. Sanville, and John O. G. Darrow, both of Murrysville, Pa., assignors to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 19, 1969, Ser. No. 825,604
Int. Cl. G11c *11/34*, *7/06*, *7/02*
U.S. Cl. 340—173 R **12 Claims**

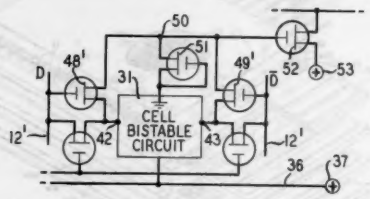


This disclosure relates to fail-safe memory circuits for storing information data comprising a source of recurrent signals which is selectively gated by the presence of a storage command signal and a holding command signal, and an amplified means receiving the gated recurrent signals and producing an output when and only when valid information data is stored.

3,609,710
ASSOCIATIVE MEMORY CELL WITH INTERROGATION ON NORMAL DIGIT CIRCUITS

Thomas E. Browne, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 29, 1969, Ser. No. 828,934
Int. Cl. G11c *11/40, 15/00, 7/00*
U.S. Cl. 340—173 AM 23 Claims

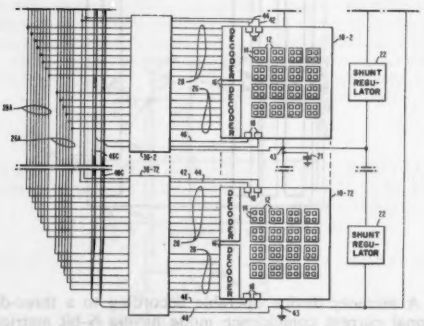


A semiconductor memory cell is adapted for associative memory use by applying interrogation input information on the normal cell digit circuits that are also used for reading and writing operations. A pair of interrogation transistors compare digit circuit signals to the prevailing state of the cell and provide a corresponding indicator signal to a memory match signal bus. Several techniques are disclosed for realizing advantageous coupling between the interrogation transistors and the match bus and for implementing a match detector circuit for use with the bus. The several techniques, in conjunction with the use of insulated gate field effect transistors and the multipurpose digit circuits, are employed in different sets of circumstances to achieve different operating features.

3,609,711
MEMORY PLANES CONNECTED IN SERIES TO A POWER SUPPLY, WITH OPTO-ELECTRONIC ACCESS

John B. Gunn, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,202
Int. Cl. G11c *5/06, 7/00*
U.S. Cl. 340—173 R 11 Claims

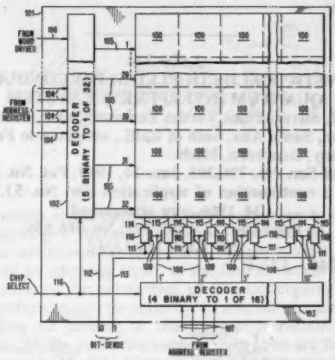


The memory is formed of semiconductor current steering bistable circuits. These circuits are arranged in groups on circuit boards with each group including the storage circuits for 1 bit position in each word. The groups of circuits are connected in series across the computer voltage supply so that essentially the same current flows through each group of circuits. With this series arrangement, the voltage level is different for each group of circuits and read/write and control signals are coupled to and from the circuits with opto-electronic coupling means which transmit signals independently of voltage level.

3,609,712
INSULATED GATE FIELD EFFECT TRANSISTOR MEMORY ARRAY

Robert H. Dennard, Croton-on-Hudson, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,220
Int. Cl. G11c *11/40;* H03k *3/286*
U.S. Cl. 340—173 FF 30 Claims

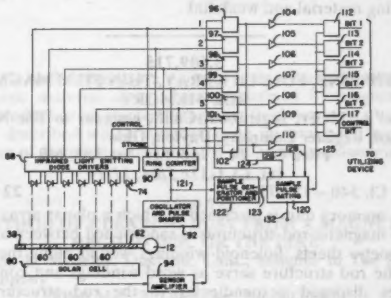


A bit oriented integrated circuit insulated gate field effect transistor memory array is disclosed which includes decoding on a semiconductor chip for both word and bit lines. Decoders which incorporate a combination of NOR logic elements and inverters provide for selection of a pair of bit lines and a single word line such that information can be written into a field effect transistor bistable circuit memory cell associated with these word and bit lines. Decoder controlled bit line switches in the form of field effect transistors are enabled to close the circuit between the bit driver and a column of memory cells. Also disclosed is a bit line biasing technique which eliminates the possibility of false writing into unselected memory cells. This is accomplished by applying a voltage via a resistance to the bit lines or by intermittently applying an appropriate voltage to the bit conductors associated with unselected memory cells.

3,609,713
DATA ENTRY MEANS

Robert M. Wooton; Duncan E. Cull, and Robert L. Robke, all of Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio

Filed Jan. 14, 1969, Ser. No. 791,118
Int. Cl. G11c *17/00, 13/04*
U.S. Cl. 340—173 LM 11 Claims



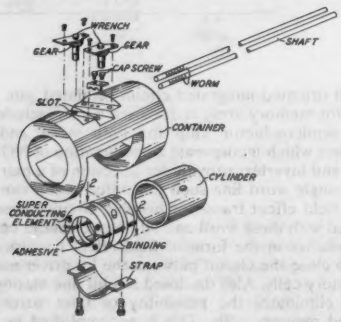
An electrooptical data entry device for translating data, which may be manually entered, as from a keyboard, into electrical signals. A plurality of radiation-emitting elements are located in a plurality of channels in the device, and a

radiation-sensitive element extends transversely across the channels. Shutter members controlled by keys of the keyboard may be selectively moved into the channels to block radiation in said channels, thus producing a change in electrical output of the radiation-sensitive element. Electrical circuitry is provided for sequentially energizing the various radiation-emitting elements to provide sequential sensing of the channels to determine which are blocked by the shutter members. Gating circuitry is provided for generating output signals representative of the information entered from the keyboard.

3,609,714
MAGNETIC FIELD COUPLED SUPERCONDUCTING QUANTUM INTERFERENCE SYSTEM

Arnold H. Silver, Palos Verdes Peninsula, and James E. Zimmerman, Santa Ana, both of Calif., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 796,303, Jan. 24, 1969, Pat. No. 3,573,759. which is a continuation of application Ser. No. 53,239, Mar. 24, 1966, now abandoned.
Filed Dec. 22, 1969, Ser. No. 886,836
Int. Cl. G11c *11/42*
U.S. Cl. 340—173.1 **3 Claims**



This disclosure relates to an electrical circuit component including a superconductive quantum interference device having a loop of superconducting material with a weak link positioned therein. The loop of superconducting material and the weak link enclose an area for the reception of magnetic flux. Means are positioned adjacent the superconductive quantum interference device for producing a varying magnetic field at the device to induce a current therein. The magnitude of the varying magnetic field is sufficient to induce a critical current in the weak link. As a result, the current induced in the superconductive quantum interference device alternately increases and decreases as the number of flux quanta changes in the area enclosed by the superconducting material and weak link.

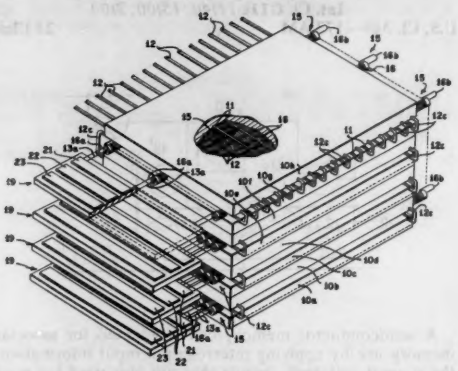
3,609,715
STRIP LINE, FOLDED ARRAY, THIN FILM MAGNETIC ROD MEMORY

Donal A. Meier, Inglewood, Calif., assignor to The National Cash Register Company, Dayton, Ohio

Filed Oct. 24, 1966, Ser. No. 588,949
Int. Cl. G11c *5/04, 11/14*
U.S. Cl. 340—174 TF **22 Claims**

A memory unit is disclosed in which a planar array of thin film magnetic rod structures is sandwiched between a pair of magnetic sheets. Solenoid windings wound along the length of the rod structure serve as word windings and conductive wires disposed perpendicular to the rod structures and between the sheets serve as digit windings or the plurality of bistable magnetic storage elements formed along the rod structures at the intersections of the conductive wires. The magnetization of each of the storage elements is axially switched to a predetermined one of its two stable states by simultaneously passing appropriate currents through the relevant solenoid winding and conductive wires. A plurality of such units are assembled together to form a three-dimensional memory matrix.

In constructing such a memory a number of magnetic sheets are placed side by side and a plurality of unbroken

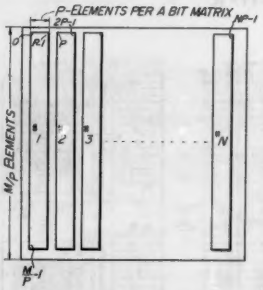


conductive wires are laid in grooves in the sheets each of the wires running across all the sheets. The memory is then formed by appropriate folding of the conductive wires and the sheets with the magnetic rod structures sandwiched between the sheets and the conductive wires acting as hinges.

3,609,716
MEMORY DEVICE

Seihin Kobayashi, and Michihiro Torii, both of Shizuoka Prefecture, Japan, assignors to Fuji Electrochemical Co., Ltd., Tokyo, Japan

Filed Sept. 20, 1968, Ser. No. 761,246
Claims priority, application Japan, Dec. 6, 1967, 42/77935
Int. Cl. G11c *5/02, 11/06*
U.S. Cl. 340—174 M **5 Claims**



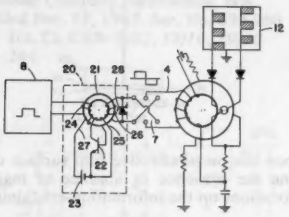
A memory device operable according to a three-dimensional current coincidence mode having N-bit matrices arranged in the X direction as a two-dimensional matrix, in which each bit matrix comprises memory elements arranged in a mat form so that there are P memory elements in the X direction and M/P memory elements in the Y direction, where M and N are the number of words and the number of bits of each work, respectively, and P is a value determined by the relation $M/P \approx NP \approx \sqrt{MN}$, and each memory element is strung with an *X*-winding, a *Y*-winding, an inhibit winding and a sense winding or a combined inhibit and sense winding, that is, a memory device operable in the three-dimensional current coincidence mode (electrically) with its memory matrix of two-dimensional arrangement (physically).

3,609,717

MAGNETIC MEMORY DEVICE

Sadamu Ohteru; Hiroshi Kobayashi, and Yushi Uchida, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Minato-ku, Tokyo, Japan

Filed Aug. 28, 1969, Ser. No. 824,704
Int. Cl. G11c *11/08, 7/00*
U.S. Cl. 340—174 CT 4 Claims



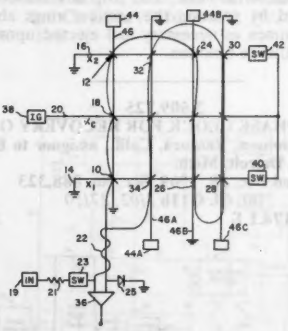
Apparatus for converting a unipolar pulse to a bipolar pulse is disclosed in accordance with the teachings of the present invention wherein a saturable magnetic core exhibiting a substantially rectangular hysteresis characteristic and admitting of first and second states of saturation is provided with an input winding, an output winding and reset winding means wound thereabout. A unipolar pulse applied to the input winding drives the magnetic core into its first state of saturation, thereby inducing a pulse of like polarity to the unipolar pulse in the output winding. When the unipolar pulse terminates, a reset current is applied to the reset winding means to drive the magnetic core into its second state of saturation, thereby inducing a pulse of opposite polarity to the unipolar pulse in the output winding. The bipolar pulses thus induced in the output winding may be utilized as write-in pulses for a transfluxor.

3,609,718

MAGNETIC ARRAY ORGANIZATION

Hubert G. De Vries, Littleton, Colo., assignor to Ferroxcube Corporation, Saugerties, N.Y.

Filed May 26, 1969, Ser. No. 827,709
Int. Cl. G11c *5/02, 11/06*
U.S. Cl. 340—174 DC 8 Claims



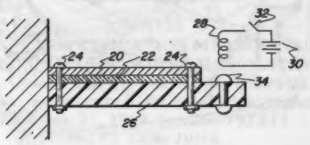
A magnetic memory matrix having a three-wire configuration including a sense winding wound through the array in a manner wherein the winding enters adjacent cores in the array and is wound in parallel with column drive lines. The sense line reenters the array in alternate columns, thereby maintaining small external array loops. A current driver coupled to an additional core line provides Delta noise cancellation.

3,609,719

FIRST ORDER TRANSITION RECORDING UTILIZING INCOMPLETE TRANSITION IRON-RHODIUM FILMS

James M. Lommel, Schenectady, N.Y., assignor to General Electric Company

Filed Dec. 17, 1969, Ser. No. 885,697
Int. Cl. G11c *11/14, 11/42*; H01v *3/04*
U.S. Cl. 340—174 TF 11 Claims



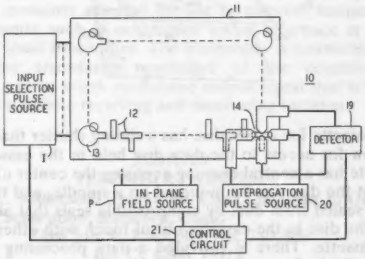
Information is thermally recorded along an iron-rhodium film exhibiting a thermal transition between the ferromagnetic and antiferromagnetic states of substantially less than 50 percent by applying strain to the film in excess of 0.3 percent to increase the percentage of film undergoing transition to the antiferromagnetic state by an amount greater than approximately 40 percent of the original transition. Selective sites of the highly antiferromagnetic film then are heated, e.g. utilizing an addressable electron beam gun, to produce a first order transition of the heated sites to the ferromagnetic state for storage of information at the site and after applying a uniform magnetic field to the film, the magnetization of each bit site is read out utilizing conventional electron mirror microscopy or secondary electron emission techniques.

3,609,720

MAGNETIC DOMAIN DETECTOR

Walter Strauss, East Orange, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1969, Ser. No. 882,900
Int. Cl. G11c *19/00, 7/00, 11/14*
U.S. Cl. 340—174 TF 6 Claims



Single wall domains are moved synchronously in a sheet of magnetic material along channels defined by magnetically soft overlays as an in-plane magnetic field reorients. A detector is described which includes as an integral part thereof a portion of the overlay defining the propagation channels.

3,609,721

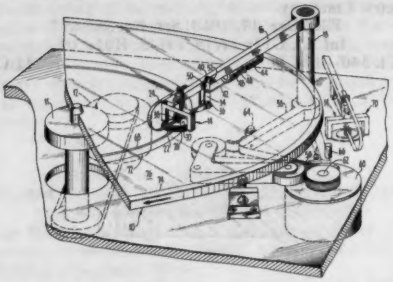
METHOD OF CLEARING DUST FROM A MAGNETIC RECORD DISC OR THE LIKE

William E. Meneley, Oakland, Calif., assignor to The Singer Company

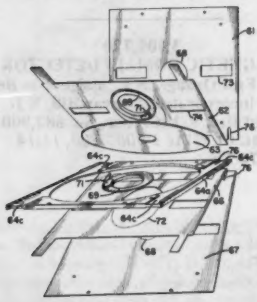
Filed Mar. 3, 1969, Ser. No. 803,863
Int. Cl. G11b *5/00*
U.S. Cl. 340—174.1 E 23 Claims

For dislodging and clearing away dust particles from the surface of a magnetic, data-storage disc, the disc is run at operating speed and a flying head is swept across it slowly, for example, at the rate of one-fourth the width of the slider

to less than one-twentieth thereof during each revolution of the storage disc. The slider may be round and have a spherical bearing face. Automatic apparatus may control such a sweep as part of a startup sequence.



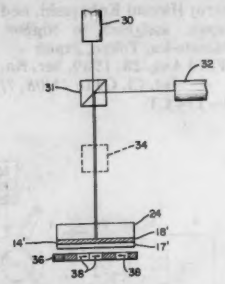
3,609,722
CENTER SEALING DATA DISC CASSETTE AND PROCESSING MACHINE
George E. Zenzefilis, 27 Los Vientos, Camarillo, Calif.
Filed Mar. 19, 1969, Ser. No. 816,874
Int. Cl. G11b *23/04, 25/04;* **B65d** *85/54*
U.S. Cl. 340—174.1 C **12 Claims**



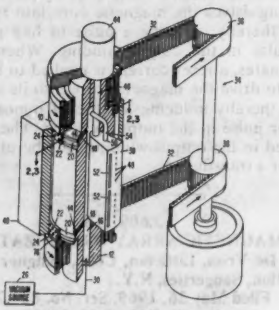
A cassette for a data disc has a sliding shutter that opens a window for access to the data disc held in the cassette. The cassette has a central opening exposing the center of the disc so that the disc can be mounted on a spindle, and this opening is sealed from dust by compressible seals that also act to hold the disc in the cassette out of touch with other parts of the cassette. There is provided a data processing machine upon which the cassette may be mounted or removed for recording or takeoff of information and wherein the final stages of mounting the cassette open the shutters and compress the seals, and the first stages of removal close the shutters and seals.

3,609,723
PIEZOREFLECTIVE-MAGNETOSTRICTIVE FILM TRANSDUCER
John K. Alstad, and James R. Wiitala, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 24, 1969, Ser. No. 887,905
Int. Cl. G11b *11/10;* **G02f** *1/22*
U.S. Cl. 340—174.1 M **10 Claims**

Magnetic information is converted to optical signals by placing a coupled piezoreflective-magnetostrictive film layer between the information-containing medium and a light source; and the pattern of magnetization on the medium induces a similar pattern of elongation or contraction in the magnetostrictive film which imparts a strain at corresponding locations in the piezoreflective film and a resulting change in reflectivity of the film. Accordingly, the reflectance of light incident upon the piezoreflective film surface can be sensed to determine the presence or absence of magnetization at particular locations on the information-containing medium.

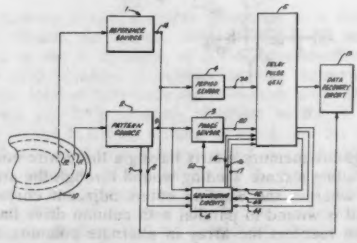


3,609,724
RANDOM ACCESS STRIP RECORDING STATION
Gary L. Allison; Laurence R. Beach, and Friedrich R. Hertrich, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 9, 1969, Ser. No. 883,520
Int. Cl. G11b *5/02, 15/38, 15/64*
U.S. Cl. 340—174.1 R **9 Claims**



A strip recording station having two vacuum rings axially spaced apart to grasp a strip record by its edges and cause the strip to conform to a cylindrical shape surrounding a positionable read/write head. The strip is revolved past the read/write head by rotating the vacuum rings about their axis, as many times as necessary and ejected upon completion of the read/write function.

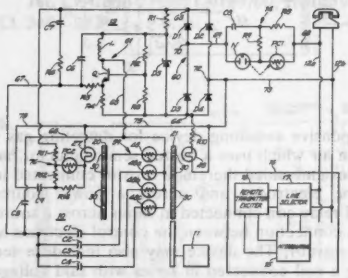
3,609,725
VARIABLE PHASE CLOCK FOR RECOVERY OF DATA
Richard C. Simonsen, Ventura, Calif., assignor to Burroughs Corporation, Detroit, Mich.
Filed Dec. 29, 1969, Ser. No. 888,323
Int. Cl. G11b *5/02, 27/10*
U.S. Cl. 340—174.1 B **20 Claims**



A system for producing a clock pulse train of prescribed phase relative to a data pulse pattern. circuit generates a

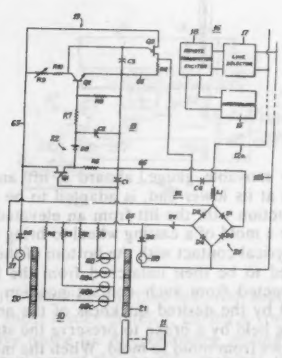
phase signal indicative of the relative phase between a reference timing pulse train and the data pulse pattern. Each reference pulse triggers an adjustable delay pulse generator which is controlled by the phase signal so that it produces pulses at the prescribed phase.

3,609,726
REMOTE METER READING SYSTEM
Victor E. Stewart, Jr., South Milwaukee, Wis., assignor to McGraw-Edison Company, Milwaukee, Wis.
Filed Dec. 15, 1967, Ser. No. 690,980
Int. Cl. G08c *9/02, 19/10, 19/28*
U.S. Cl. 340—204 **14 Claims**



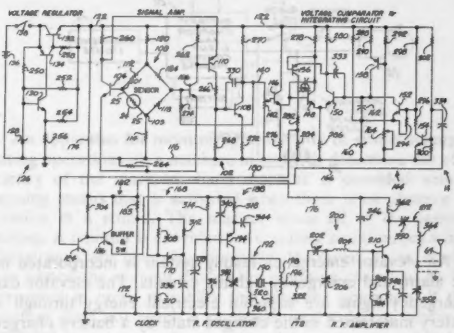
A position encoder and transponder for use in an automatic remote meter reading system and including disc means coupled to the meter being read and perforated in accordance with a position code and position means having a plurality of photoresponsive information bit means operatively associated with the coded disc. An oscillator provides a tone signal in accordance with a capacitive parameter and capacitance means is associated with each photoresponsive means for being placed in a parallel circuit relation with the capacitive parameter in accordance with the position of the coded disc so that a different tone signal will be provided for each disc position.

3,609,727
REMOTE METER READING SYSTEM
Richard E. Riebs, Hales Corners, Wis., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Mar. 17, 1969, Ser. No. 807,898
Int. Cl. G08c *19/36, 19/28, 19/26*
U.S. Cl. 340—204 **22 Claims**



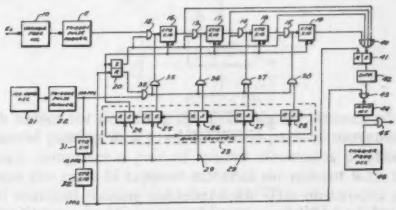
A position encoder and transmitter for an automatic remote meter reading system having a first oscillator producing a relatively high frequency pulse rate and a second oscillator producing a lower frequency pulse rate for disabling the first oscillator and which is determined by the value of the circuit parameters of the second oscillator. An encoder means varies the value of the circuit parameters in accordance with the position of the meter being read so that the rate of the low frequency pulse rate and the number of interruptions of the high frequency pulse rate during a predetermined interval of time indicates the position of the meter.

3,609,728
PORTABLE REMOTE LOCATION MEASURING SYSTEM UTILIZING PULSE WIDTH MODULATION
Richard M. Quinn, and Jerome A. Kwiatkowski, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.
Filed Jan. 21, 1969, Ser. No. 792,611
Int. Cl. G08c *19/16*
U.S. Cl. 340—206 **16 Claims**



A portable system for measuring a condition, particularly temperature, and transmitting a signal indicative of the condition to a remote location. A portable insulating and protective dry container adapted for use in extreme temperature environments, such as occasioned within a furnace or oven, houses a small transmitter. The transmitter is connected to a bridge-type transducer responsive to the condition to produce a pulse width modulated output signal that is transmitted to a remote receiving and monitoring location.

3,609,729
TELEMETRY SYSTEM
Wilmer C. Anderson, Greenwich, Conn., assignor to General Time Corporation, Stamford, Conn.
Filed Jan. 6, 1969, Ser. No. 789,209
Int. Cl. G08c *19/16*
U.S. Cl. 340—206 **17 Claims**



A telemetry system including a transmitter wherein a numerical count proportional to a parameter is momentarily stored in a series arrangement of multistage counters and wherein additional pulses are applied to the multistage coun-

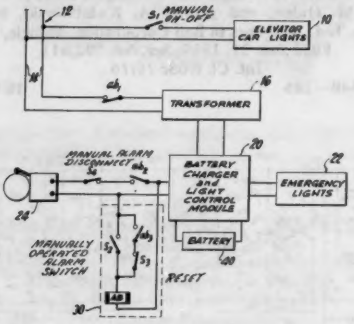
ters in succession to develop a plurality of time positioned pulses suitable for transmission. The system also includes a receiver for displaying the transmitted data.

3,609,730

ELEVATOR EMERGENCY TESTING SYSTEM

Stephen A. Hornung, Louisville, Ky., assignor to K. M. White Company, Inc., Louisville, Ky.

Filed Mar. 21, 1969, Ser. No. 809,136
Int. Cl. G08b 29/00
U.S. Cl. 340—214 **4 Claims**



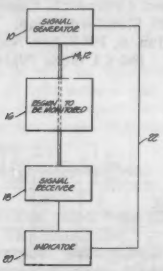
An elevator emergency testing system is incorporated in the alarm and emergency lighting circuits. The elevator car emergency lights are supplied electrical energy through a battery maintained in the charged state by a battery charger and light control module which is fed by the car service supply voltage. One pole of an elevator alarm button is employed to trigger the alarm in the conventional sense while another pole of the same button automatically disconnects the car supply voltage triggering the emergency lights.

3,609,731

REVERTIBLE TEMPERATURE DETECTOR

Joseph H. Evans, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Aug. 15, 1968, Ser. No. 752,881
Int. Cl. G08b 21/00; G01k 11/06
U.S. Cl. 340—227 C **7 Claims**



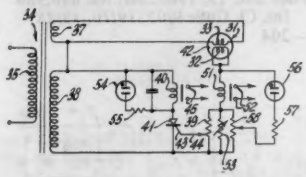
A rapid, sensitive, revertible temperature monitoring system using a substantial change in impedance of a medium to a signal at a temperature-dependent change of physical condition, e.g., a change of state. In particular a system in which the transmission of ultrasonic waves through a meltable wire is monitored to indicate the temperature of the environment.

3,609,732

GAS RESPONSIVE SWITCHING DEVICE

Riichiro Kasahara, Kobe, and Yuichi Shimakawa, Osaka, both of Japan, assignors to New Cosmos Electric Co., Ltd., Higashiyodogawa-ku, Osaka, Japan

Filed May 21, 1970, Ser. No. 39,354
Claims priority, application Japan, May 28, 1969, June 5, 1969, July 11, 1969, 44/49788;44/52642;44/66083
Int. Cl. G08b 21/00
U.S. Cl. 340—237 R **6 Claims**



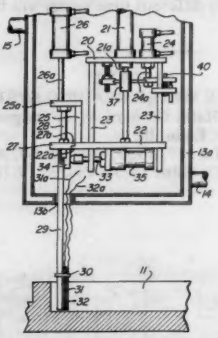
A gas responsive switching device for detecting gas concentrations in air which uses a heated semiconductor having two electrodes embedded therein, a resistor connected in series with the electrodes and across a power source, a thyristor and relay coil connected in series across a source of power and a connection between the control electrode and a tap on said resistor. The device may also include a second relay having a coil connected in series with said voltage divider and adjusted so that both relays operate at two different gas concentrations.

3,609,733

APPARATUS FOR CONTROLLING THICKNESS OF CAST ANODE COPPER AND THE LIKE

Henry W. Franz, Salt Lake City, Utah, assignor to Kennecott Copper Corporation, New York, N.Y.

Filed Sept. 18, 1969, Ser. No. 859,095
Int. Cl. G01f 23/04
U.S. Cl. 340—244 **8 Claims**



A vertically movable gauge, aboard a lift and carrying sensing means at its lower end, is adapted to be lowered in latched conjunction with the lift from an elevated clearance position above a mold of a casting wheel to bring the sensing means into physical contact with the bottom of the mold; it is further adapted to be then unlatched from the lift and individually retracted from such contact position a distance predetermined by the desired thickness of the anode, while the lift is being held by a brake to preserve the starting position which varies from mold to mold. When the molten metal poured into the mold rises to the level of the retracted sensing means, it causes a signaling and/or control system to be actuated. Pouring is immediately stopped, manually or automatically. The brake is then released and the lift raised to its original position, meanwhile picking up the retracted

gauge device. The gauge is driven down to its original extended position relative to the lift and is relatched to the lift at the original wheel-clearance level, which permits rotation of the casting wheel to remove the full mold and to position an empty mold.

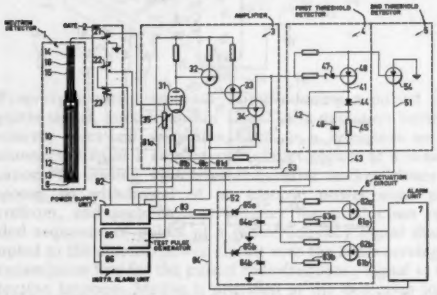
The apparatus is preferably pneumatically or hydraulically operated in conjunction with a fluidic control circuit and electrical sensing and control circuitry.

3,609,734

CURRENT SUPERVISION CIRCUIT

Arne Lennart Svansson, Nykoping, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden

Filed May 26, 1967, Ser. No. 641,531
Int. Cl. G08b 21/00; G01t 3/00; H01j 39/33
U.S. Cl. 340—253 7 Claims



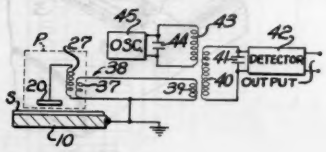
A circuit for supervising an electric current and giving an alarm when the current exceeds a predetermined upper limit defined by a first threshold detector, or drops below lower limit defined by a second threshold detector.

3,609,735

INDUCTIVE-CAPACITIVE PROBE IN MACHINE FOR HANDLING SHEETLIKE MATERIAL

Walter E. Dauterman, Willowick, and George Y. Ono, Mayfield Heights, both of Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Dec. 3, 1968, Ser. No. 780,763
Int. Cl. G08b 21/00; B65h 25/14
U.S. Cl. 340—259 10 Claims



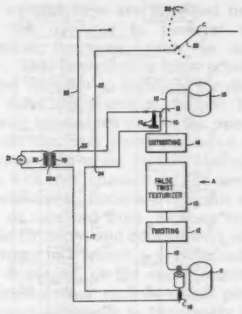
Machine for handling sheetlike material, such as a printing press and a sheet feeder therefor, having a combined inductive-capacitive probe for discriminating among the presence of a single thickness of the sheetlike material, the absence of the material, and the presence of excessively thick sheetlike material, such as two or more superimposed sheets, or for determining the moisture content of the sheetlike material. The probe is substantially insensitive to machine vibrations.

3,609,736

STRAND MONITORING APPARATUS

John M. Cochran, Jr., Greenville, S.C., assignor to Frontier Electronics, Inc., Greenville, S.C.

Filed Feb. 16, 1970, Ser. No. 11,464
Int. Cl. G08b 21/00
U.S. Cl. 340—259 10 Claims



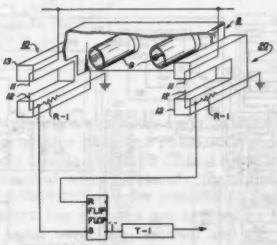
An apparatus for monitoring a plurality of strand manipulating operations on a machine in order to determine the efficiency of the machine. Each machine is provided with a sensing means that is activated when there is an absence of tension in a strand. The scanner scans all of the sensing means. A counter is provided for counting count pulses when the strands are operating normally. However, if the strand has parted the scanner causes the counting circuit to be interrupted in order to inhibit the counting operation. If the counter does not reach a predetermined value an alarm is sounded.

3,609,737

METHOD AND APPARATUS FOR ARTICLE DETECTION UTILIZING CORONA DISCHARGE

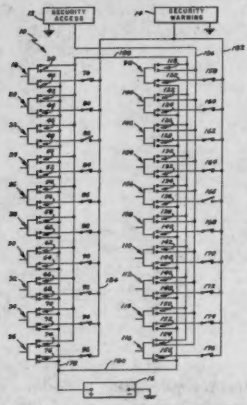
Martin Howard Lustig, Rochester, and Norman Robert LaFond, Webster, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Filed June 28, 1968, Ser. No. 740,942
Int. Cl. G08b 21/00
U.S. Cl. 340—259 6 Claims



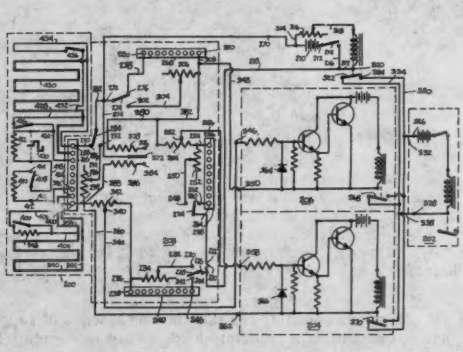
A sensor for detecting the presence or absence of support material passing in a predetermined path of movement. The sensor comprises a pair of spaced electrodes positioned adjacent the path of support material movement with the support material passing therebetween. The electrodes are supported by a suitable insulator and the spacing and voltage differential therebetween predetermined to generate a current which indicates the presence or absence of a support material passing between the electrodes. The output from the sensors is coupled to a suitable detector to control the operation of the automatic xerographic reproducing machine in accordance with the passage of the support material.

3,609,738
SECURITY ACCESS CONTROL AND ALARM SYSTEM
Egon Marte, 2335 Argonne Drive, Minneapolis, Minn.
Filed Jan. 14, 1970, Ser. No. 2,896
Int. Cl. G08b 13/22
U.S. Cl. 340—274 7 Claims



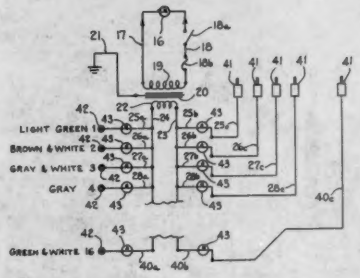
A control system for a restricted area to which only authorized personnel should have access in which the user operates a switching system to gain admittance. So long as the persons seeking admittance operate the required number of switches, the control system will allow access to the area, but will signal a remote alarm unless the operated switches correspond to a preset combination which is given only to authorized personnel.

3,609,739
ALARM AND DETECTION SYSTEMS COMPRISING ELECTRICAL CONDUCTIVE COATING
John W. Walter, 511 Manhasset Woods Drive, Manhasset, N.Y.
Filed Nov. 21, 1968, Ser. No. 777,653
Int. Cl. G08b 13/00, 13/04
U.S. Cl. 340—274 3 Claims



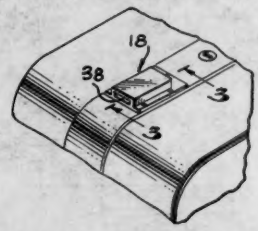
An alarm system for protection against unauthorized intrusion which comprises a closed electric circuit and an alarm responsive to a break in said closed circuit and further comprising a four-leg bridge circuit wherein each leg of the bridge comprises a different resistive portion of said closed circuit or comprises a nonresistive value to balance any part or all of an unused leg of said bridge. A plurality of high gain amplifiers are each associated with a different pair of legs of said bridge circuit and each amplifier is attached to detect a change in the resistive value of said leg pairs and to produce a current in response to said change, which current actuates said alarm. This alarm system makes virtually impossible the compromising of the alarm system by shunting any terminals of any switch, actuator, connecting leads, or entrance or exit terminals of any surface to be protected.

3,609,740
COLOR PERCEPTION TESTER
T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Robert B. Martin, Satellite Beach; Eddie L. Brawner, Cape Canaveral, and Wayne E. Pate, Orlando, all of Fla.
Filed Sept. 9, 1969, Ser. No. 856,327
Int. Cl. G08b 21/00; G09b 1/00
U.S. Cl. 340—279 2 Claims



A color perception tester for testing individuals in order to determine if the individual can correctly identify wires in accordance with their respective color code. The tester includes a plurality of colored wires, which, when plugged in the appropriate receptacle or plug, will cause a pair of adjacent lamps to be illuminated. Indicia is printed adjacent the plug identifying the proper colored wire which should be plugged in the circuit.

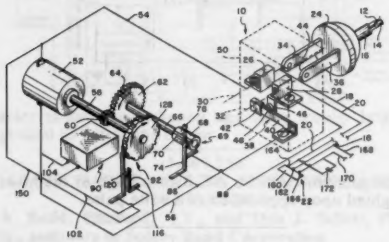
3,609,741
PREVENTION OF UNAUTHORIZED MOVEMENT OF ARTICLES BETWEEN PREDETERMINED AREAS
Wendell S. Miller, 1341 Comstock Ave., Los Angeles, Calif.
Filed Mar. 21, 1969, Ser. No. 809,259
Int. Cl. G08b 13/14
U.S. Cl. 340—280 16 Claims



A system for indicating an attempt to move an article, such as a piece of baggage or an article of merchandise, between predetermined areas, by providing a radio transmitter and radio receiver between the areas, and providing on the article a device having electrical circuitry adapted to receive from the transmitter a signal at a first frequency, and retransmit a radio signal of changed frequency, with the receiver being constructed to respond to and indicate the presence of the return signal. A person authorized to move the baggage or other article may have a key adapted to disable the circuitry against transmission of the changed frequency signal, or

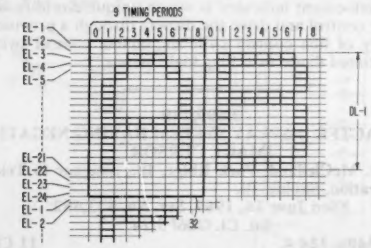
otherwise alter the signal, in a manner indicating to the receiver his authorization.

3,609,742
PROPERTY SECURITY SYSTEM
Hugh D. Burdick, 1602 Alta, Wichita, Kans.
Filed Feb. 7, 1969, Ser. No. 797,441
Int. Cl. H04m *11/04*
U.S. Cl. 340—310 9 Claims



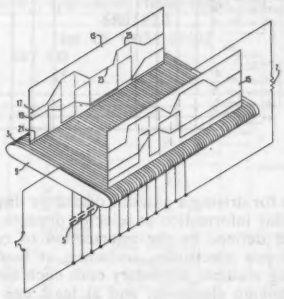
Property security apparatus for producing a pulsed perceptible signal, audible and/or visual, at a detection location whenever electrical apparatus, such as a television set, is disconnected from a convenience outlet socket at a remote location. A sensing switch at the outlet socket closes in response to withdrawal of an electric power cord plug therefrom, and such closure initiates the production of a coded sequence of pulses of a radiofrequency signal that is coupled to the electric power circuit with the latter serving as a transmission line for the pulsed radiofrequency signal to the detection location. Means is provided at the detection location for pulsing a perceptible signal generator in synchronism with the detection of radiofrequency pulses. The sequence of radiofrequency pulses are uniquely coded whereby identification of the particular sensing switch can be made, when a plurality of combined sensing switch and radiofrequency signaling units are employed at a plurality of different locations.

3,609,743
DISPLAY UNIT
Murray Lasoff, Downingtown, Pa.; Irwin R. Holmes, Willingboro, N.J.; John R. Port, King of Prussia, and Edward F. Myers, Lansdowne, Pa., assignors to Burroughs Corporation, Detroit, Mich.
Filed Feb. 1, 1967, Ser. No. 613,264
Int. Cl. G08b *11/00*
U.S. Cl. 340—324 14 Claims



The cathode-ray tube of a standard television monitor is used for presenting a visual display of alphanumeric characters, punctuation marks and other marks used in business correspondence, and which have been placed into a storage device in binary coded form. A character generator is sensitive to the character codes in the storage device and, in timed relation with the scanning of the cathode-ray tube screen by the cathode beam, it generates and causes the display of horizontal portions of each character. A keyboard is provided to enable an operator to enter and load data for display into the storage device. An input device is also provided to enable a local or remotely situated device, which may be another display unit or data processor, for example, to also enter and load data for display into the storage device. A cursor presentation, in the form of a movable mark or symbol, which is displayed on the cathode-ray tube screen, is provided to enable the operator to visually determine the place on the screen where the next alphanumeric entry is to take place. Several control keys are provided on the keyboard which enable the operator to perform various normal typewriter control functions, such as carriage return, backspace, etc. The keyboard is also provided with keys which enable the operator to highlight the display by underscoring one or more characters, as desired. The keyboard is also provided with keys which enable the operator to correct or otherwise edit the data being displayed on the screen. Thus, the operator may erase certain characters, or simply overwrite them with new characters. The invention provides the necessary electronic circuits to permit messages to be transmitted to, or received from, local or remotely situated devices. Suitable circuitry, and control keys on the keyboard, enable the operator to transmit a preselected portion of the message being displayed, or the entire message, as desired. Also, an associated device, such as a data processor, for example, can transmit a message to the display unit and have it displayed on a selected area of the screen. The circuitry also permits the data processor to control the transmission of data to it, so that it can cause all or only a part of the screen area display to be transmitted to it.

3,609,744
DELAY LINE CHARACTER GENERATOR
Kenneth A. Pearson, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 15, 1968, Ser. No. 713,529
Int. Cl. H01j *29/70*
U.S. Cl. 340—324 A 4 Claims

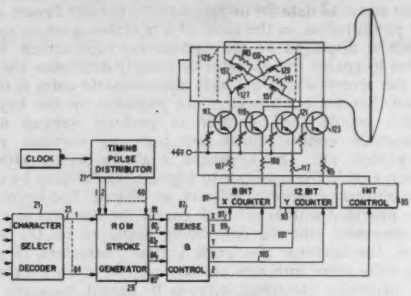


A device for generating a character upon a CRT tube consisting of a pulse generator placing a pulse upon a delay line which is capacitively coupled to three etched sense wires, the voltages induced on said wires ultimately controlling the X-deflection, the Y-deflection, and the unblanking function of the CRT tube. Before the voltages are applied to the CRT tube, the correct sense wires are selected and the voltages thereon are amplified.

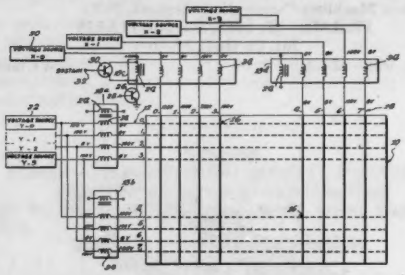
3,609,745
SYMBOL DISPLAY APPARATUS
William R. Lamoureux, Kingston, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 15, 1968, Ser. No. 721,477
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 7 Claims

A direct view display system adopted to operate with a data processor combines a constant time variable velocity display system with uniform intensity. Symbols are selectively generated as a sequence of strokes from a capacitor read-only storage. By applying these strokes through the deflec-

tion control circuitry of the cathode-ray tube at a rate which exceeds the time constant of the high frequency yoke, a quasi-integration of the input staircase is provided resulting in uniform display intensity.



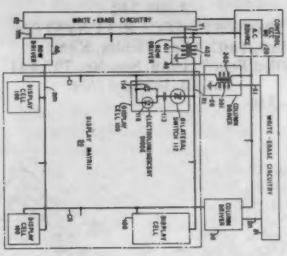
3,609,746
APPARATUS FOR DRIVING PLASMA PANELS
Ray L. Trogdon, Urbana, Ill., assignor to University of Illinois Foundation, Urbana, Ill.
Filed Oct. 8, 1968, Ser. No. 765,938
Int. Cl. G08b *5/36*
U.S. Cl. 340—324 R **6 Claims**



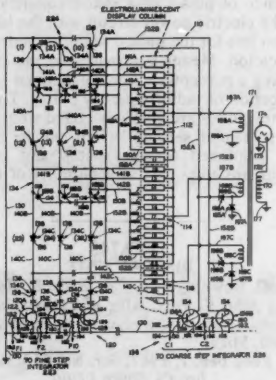
Apparatus for driving a gaseous discharge display panel in order to display information at selected discrete points in the display panel defined by the intersection of corresponding column and row electrodes, including at least one transformer having multiple secondary coils each connected to a respective column electrode, and at least one other transformer having multiple secondary coils each connected to a respective row electrode, a pair of complementary signal sources each connected to a corresponding one of said transformers, means for addressing selected points in the display panel coupled to a primary coil of respective transformers for entering information into the panel, and the signal sources coupling sustaining signals through the respective secondary coils for maintaining the information in the panel, the signal sources and the addressing means being electrically isolated from the panel electrodes.

3,609,747
SOLID-STATE DISPLAY CIRCUIT WITH INHERENT MEMORY
Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 5, 1968, Ser. No. 781,534
Int. Cl. H05b *33/00*
U.S. Cl. 340—324 R **11 Claims**

The need for external memory and image regeneration circuitry in light-emitting semiconductor diode display circuits is eliminated by providing each light-emitting diode with a respective capacitive storage element and bilateral breakdown switch. The bilateral switch and storage element function as inherent memory for the light-emitting diode, operating in conjunction with an AC bias voltage to maintain the diode lighted upon application of a write pulse.



3,609,748
CONTROL NETWORK FOR A SOLID STATE DISPLAY SYSTEM
Walter Parfomak, Wallington, N.J., and Robert J. Molnar, New York, N.Y., assignors to The Bendix Corporation
Filed Sept. 17, 1968, Ser. No. 760,303
Int. Cl. G01d *7/00*
U.S. Cl. 340—324 **8 Claims**

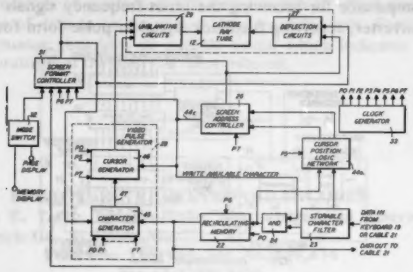


A control network for a solid-state display system which indicates the value of an input control signal on a segmented electroluminescent indicator in which unique circuitry is employed to control and drive the display through a provision of a plurality of fine control switches, coarse control switches and associated diode switching logic means.

3,609,749
CHARACTER DISPLAY SYSTEM HAVING NEGATIVE IMAGE CURSOR
Walter B. McClelland, Park Ridge, Ill., assignor to Teletype Corporation, Skokie, Ill.
Filed June 16, 1969, Ser. No. 833,452
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A **11 Claims**

A negative image cursor is provided for marking a selected location on a cathode-ray tube screen which displays, in human readable form, alphanumeric characters and other graphics and symbols outpulsed at a clock rate from a recirculating memory associated with a keyboard or computer controlled data terminal. A sequence of unblanking pulses arranged in a pattern indicative of each character to be displayed on the screen in dot raster form is normally applied to the tube with a polarity effective to form a brightened character against a darkened screen background. During the clock period corresponding to the address of the screen loca-

tion to be marked, the polarity of the unblanking pulses in the corresponding sequence is inverted so that the marked



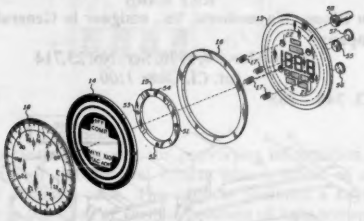
character shows up darkened against a locally brightened background to define the cursor.

3,609,750

GAS DISCHARGE BEARING DISTANCE HEADING INDICATOR

Lee A. Budd, Pittsford, N.Y., and Dan J. Schott, Phoenix, Ariz., assignors to Sperry Rand Corporation

Filed May 13, 1968, Ser. No. 728,418
Int. Cl. H01j *17/04*
U.S. Cl. 340—336 8 Claims



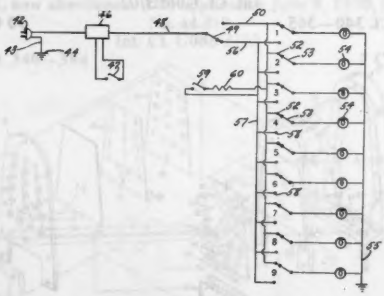
A cold cathode gas discharge lamp having a ring of radially directed cathode elements on an electrically insulating substrate underlying a pair of concentric transparent ring anodes of different diameter for displaying aircraft heading and aircraft bearing (with respect to ground radio transmitters), respectively. Additional cathode elements are placed inside the aforesaid cathode rings on the same substrate underlying a third transparent anode for the display of alpha-numeric (distance) and annunciator data. Selected ones of the cathodes and anodes are energized to cause localized glow discharges viewable through the anodes for representing desired data.

3,609,751

COLOR ORGAN

Robert J. Siegel, 919 S. Long Beach Ave., Freeport, N.Y.

Filed Nov. 6, 1968, Ser. No. 773,913
Int. Cl. G09f *13/04*
U.S. Cl. 340—337 3 Claims



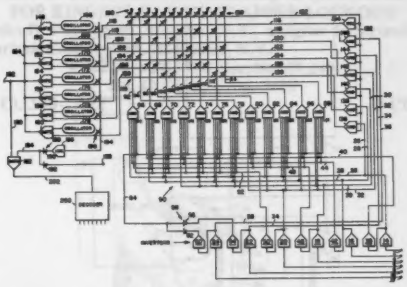
A manually operated color organ, including a keyboard consisting of manually operated electrical switches, and a display having illuminated compartments or segments, the keyboard corresponding in configuration to the arrangement pattern of the display. Means is provided for supplying illumination of varying colors to each illuminated segment of the display, and a separate keyboard is provided for each color.

3,609,752

SIMULTANEOUS DATA ENCODER AND DECODER

Richard C. Grosser, c/o Industrial Data Reduction, 325 Chestnut St., Philadelphia, Pa.

Filed June 21, 1968, Ser. No. 739,090
Int. Cl. H03k *13/243*
U.S. Cl. 340—347 DD 12 Claims



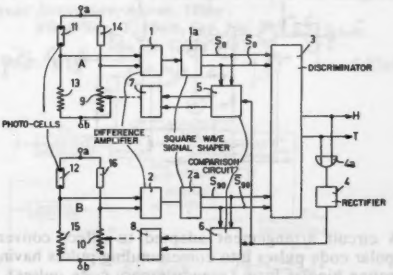
Encoding circuitry, receiving combinations of pulses at input terminals, produces combinations of audio frequency tones at an output terminal. For certain characters, the combinations of tones are restricted to pairs of tones corresponding to the standard "touch-tones" used in telephone dialing. The tones produced in response to other characters are not so restricted. The same output terminal serves as an input terminal to a decoding circuit, which translates combinations of tones into direct current signals at a plurality of terminals. The decoding circuitry is disabled while tones are produced by the encoding circuitry.

3,609,753

DISPLACEMENT-MEASURING DEVICE

Scato Albarda, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Phillips Corporation, New York, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,458
Claims priority, application Netherlands, Jan. 23, 1968, 6801010
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 AD 4 Claims



The output terminals of a discriminator for resolving the output of a pair of scanners in two separate pulse series each corresponding in frequency to the displacement of a scanned object are coupled through an OR gate into a rectifier. The rectifier provides an enabling output during such displacement to circuit for adjusting the effective output of the scanners.

3,609,754

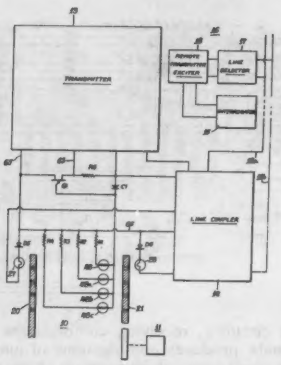
POSITION-ENCODING DEVICE WITH FREQUENCY CODED OUTPUT SIGNALS

Richard E. Riebs, Hales Corners, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Mar. 17, 1969, Ser. No. 807,560
Int. Cl. G08c *9/06*
U.S. Cl. 340—347 P 13 Claims

This invention relates to a position encoder for use in an automatic remote meter-reading system including a pair of

coded discs each having a plurality of groups of position-coding elements. A plurality of photocells are disposed between the discs and are arranged to be selectively energized from their opposite sides by individual-illuminating means associated with each disc. The presence or absence of illumination on each photocell is operative to modify the parameters of an oscillating circuit so that the circuit has a different frequency for each position of the coded discs.



3,609,755

UNIPOLAR TO BIPOLAR CODE CONVERTER

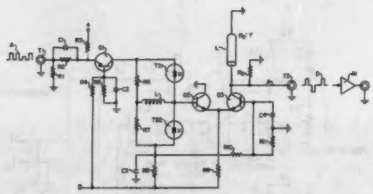
Alessandro Fenyves, Milan, Italy, assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 12, 1969, Ser. No. 823,676

Claims priority, application Italy, Sept. 24, 1968, 21592 A/68

Int. Cl. G06f *5/00*; H04l *3/00*; H03k *13/24*

U.S. Cl. 340—347 DD **2 Claims**



A circuit arrangement adapted to effect conversion of unipolar code pulses into corresponding pulses having an alternating bipolar form (pseudoternary code pulses). By employing the reflection occurring in a line matched to the conversion circuit and short circuited at the distant terminal, the usual two separate channel double regeneration technique is avoided.

3,609,756

DEVICES FOR PRODUCING OUTPUT SIGNALS IN DIGITAL FORM

James Richard Halsall, Reading, and Alan Percy Cooper Murrell, Millbrook, Guildford, both of England, assignors to Imperial Chemical Industries Limited, London, England

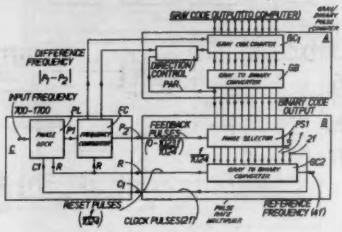
Filed May 19, 1969, Ser. No. 825,633

Claims priority, application Great Britain, May 22, 1968, 24418/68

Int. Cl. H03k *13/02*

U.S. Cl. 340—347 AD **18 Claims**

A frequency-to-digital converter for producing continuously available output signals in digital form including a pulse counter which produces an output in Gray code, a binary pulse rate multiplier coupled to the counter and a frequency comparator for receiving the input frequency signals to the converter, receiving feedback signal in pulse form form the



multiplier, and supplying output signals to the first counter, the repetition rate of the feedback signals being proportional to the Gray code output of the first counter, so that the output of the first counter in Gray code forms the output of the converter in digital form.

3,609,757

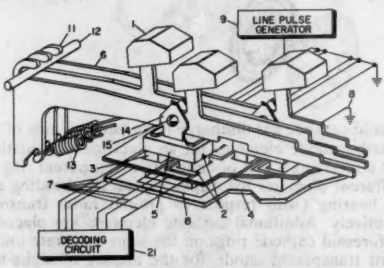
BALL AND CLIP FOR ATTACHING FERRITE CORES TO KEY BARS

Corbin Dixon, Waynesboro, Va., assignor to General Electric Company

Filed Mar. 30, 1970, Ser. No. 23,714

Int. Cl. G08c *1/00*

U.S. Cl. 340—365 **8 Claims**



A ball joint suspension which permits accurate self-alignment of a magnetic plate movable through space to intimately close magnetic core circuit for producing electrical signals.

3,609,758

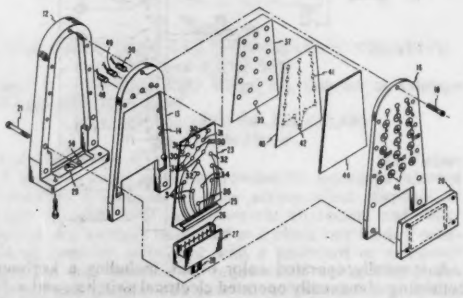
KEYBOARD ENTRY DEVICE

David A. Buesing, Byron, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 2, 1969, Ser. No. 821,376

Int. Cl. G06f *3/02*

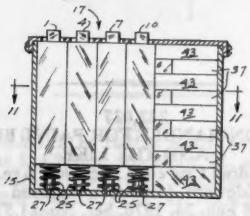
U.S. Cl. 340—365 **10 Claims**



A hand-held keyboard data entry device including an actuator for entry of data and the operation of functional controls. The keyboard utilizes a diaphragm switch matrix to provide a compact keyboard switch arrangement which is

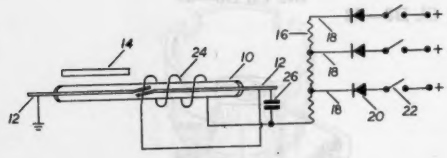
operated by exertion of minimum forces. The actuator includes a switch means which must be operated in addition to the actuation of a selected data entry switch to effect transmission of data to an associated data receiving unit. Further the actuator generates an audible sound which indicates to an operator that the data has been entered.

3,609,759
PHOTOELECTRIC KEYBOARD ENCODER
Daniel E. Teske, Spanish Lake, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Dec. 31, 1969, Ser. No. 889,474
Int. Cl. G08c *9/06*
U.S. Cl. 340—365 **10 Claims**



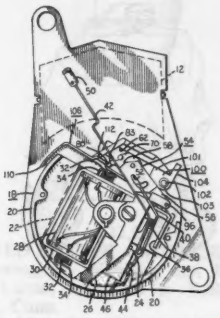
A photoelectric encoder for converting information, such as numbers of the decimal system into a series of digital signals of a binary code. The encoder includes a keyboard with keys in the form of vertical columns of light transparent material, each having therein a predetermined number of reflective surfaces. The keys are arranged in parallel rows with a light source to one side of the keyboard and photocells, at predetermined vertical levels, adjacent another side of the keyboard. The reflective surfaces throughout the keyboard are predeterminately located such that no light is transmitted through the keys to the photocells when the keys are in their raised positions. When a key is depressed, one or more light reflecting surfaces are moved in such positions that light is reflected to one or more of the photocells to thereby produce one or more binary code pulses.

3,609,760
AUDIBLE SIGNAL HAVING GLASS FEED RELAY
Kajetan Rynowiecki, 87 Wessington Ave., Garfield, N.J.
Continuation-in-part of application Ser. No. 795,099, Jan. 29, 1969, now abandoned. This application June 8, 1970, Ser. No. 44,419
Int. Cl. G08b *3/10*
U.S. Cl. 340—384 **7 Claims**



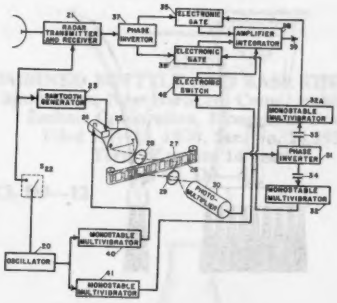
Apparatus for producing an audible signal when a voltage is applied thereto. The apparatus includes a reed switch having electrical contact leads, means responsive to the voltage to cause the switch to open and close periodically whereby the leads vibrate, and means responsive to the vibration to produce said signal.

3,609,761
VOLUME CONTROL AND SILENCING MECHANISM FOR RINGERS HAVING CLAPPER LOCKOUT
Amedio D. Petrangelo, Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.
Filed July 29, 1970, Ser. No. 59,240
Int. Cl. H04g *3/00, 3/10*
U.S. Cl. 340—402 **9 Claims**



A volume control and silencing mechanism for a ringer having a clapper under the gong includes a movable actuator for engaging a spring in contact with the inside of the gong for controlling the volume of the of the ringer and also for positioning a guide for limiting the clapper movement to silence the ringer. A lockout lever is provided to prevent the actuator from inadvertently silencing the ringer when the ringer volume is adjusted.

3,609,762
DIRECT GRADIENT-CORRELATION APPARATUS
Nicholas D. Diamantides, Cuyahoga Falls, Ohio, assignor to Goodyear Aerospace, Akron, Ohio
Filed Nov. 7, 1966, Ser. No. 592,532
Int. Cl. G01s *9/02*
U.S. Cl. 343—5 DP **5 Claims**

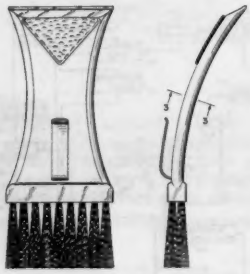


The invention provides an electronic system to achieve correlation and matching information between two similar optical displays without mechanically or electronically nutating or moving one display relative to the other. Essentially this is achieved by breaking both displays into a series of voltage signals which can be electronically summed to obtain a difference signal whereby the difference signal is scaled to determine the direction and amount of position or offset error between the two displays.

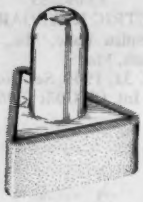
SEPTEMBER 28, 1971

222,024
CAP WITH ATTACHED LOCKS OF HAIR
Angelika Marie Frackowiak, 17 Bendale Blvd., Scarborough, Ontario, Canada
Filed Dec. 1, 1969, Ser. No. 20,323
Claims priority, application Canada June 2, 1969
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—243

222,025
COMBINATION BRUSH AND SCRAPER
Wiley M. Whitaker, Asheboro, N.C., assignor to Whit Corporation, Asheboro, N.C.
Filed July 27, 1970, Ser. No. 24,137
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—6



222,026
PAINT APPLICATOR
Elias J. Johnson, 503 Stevens St., Green Bay, Wis. 54303
Filed June 22, 1970, Ser. No. 23,586
Term of patent 14 years
Int. Cl. D4—*04*
U.S. Cl. D4—38

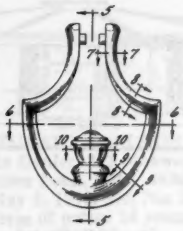


222,027
EXTENSION HANDLE FOR PAINT BRUSHES AND THE LIKE
Mildred Craven, 5 Highview Ave., Edgware, Middlesex, England
Filed Feb. 24, 1970, Ser. No. 21,572
Claims priority, application Great Britain Aug. 29, 1969
Term of patent 14 years
Int. Cl. D4—*99*
U.S. Cl. D4—99

222,028
PIPE AND TUBE BENDER
John D. Benfield, 2920 E. Jefferson Ave., Detroit, Mich. 48207
Filed June 30, 1970, Ser. No. 23,769
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—32

222,029
HAND POWER TOOL
David C. McElroy, St. Clair Shores, Mich., assignor to Thor Power Tool Company, Aurora, Ill.
Filed July 20, 1970, Ser. No. 24,032
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—68

222,030
BAIL FOR DOOR KNOCKER
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 25, 1970, Ser. No. 23,115
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—177



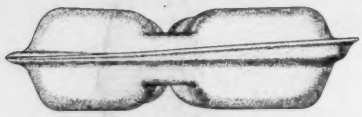
222,031
INSERT HUB FOR A RIBBON SPOOL
Robert P. Buhram and Richard D. Hensley, Farmersville, Ohio, assignors to Columbia-Great Lakes Corp., Dayton, Ohio
Filed Feb. 20, 1970, Ser. No. 21,536
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—220

222,032
COMBINED BOTTLE AND BASE THEREFOR
Robert J. Donoghue, Windsor, Conn., assignor to Emhart Corporation, Bloomfield, Conn.
Filed July 24, 1970, Ser. No. 24,113
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—12

222,033
COMBINED BOTTLE AND BASE THEREFOR
Robert J. Donoghue, Windsor, and Bjorn Bagn, New Hartford, Conn., assignors to Emhart Corporation, Bloomfield, Conn.
Filed July 24, 1970, Ser. No. 24,114
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—12

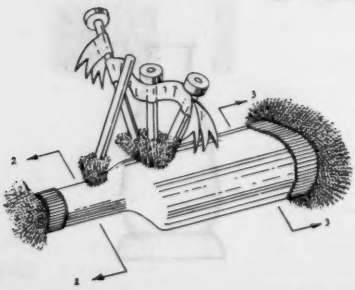
222,034
COMBINED BOTTTLE AND BASE THEREFOR
Bjorn Bagn, New Hartford, Conn., assignor to Emhart Corporation, Bloomfield, Conn.
Filed July 28, 1970, Ser. No. 24,193
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—12

222,035
COVERED HOT FOOD TRAY
Steven J. Cyr and Mark W. Whelan, Chippewa Falls, Wis., and Kenneth L. Jones, Fullerton, Calif., assignors to Standard Oil Company, Chicago, Ill.
Filed Aug. 25, 1969, Ser. No. 18,833
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—185

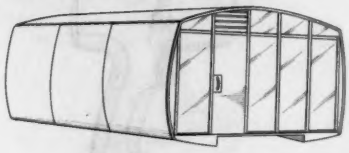


222,036
OVERCAP FOR A PRESSURIZED CONTAINER
Herbert R. Carpenter, Kenilworth, Ill., assignor to Seaquist Valve Company, Division of Pittway Corporation, Cary, Ill.
Filed July 24, 1970, Ser. No. 24,123
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258

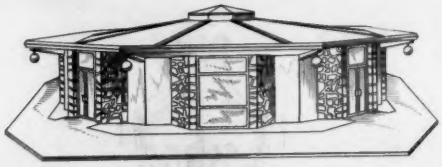
222,037
BOTTLE COVER OR SIMILAR ARTICLE
Alan R. Fairlie, 417 Queensberry Road, Edinburgh 4, Scotland
Filed May 15, 1969, Ser. No. 17,157
Claims priority, application Great Britain Nov. 20, 1968
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—259



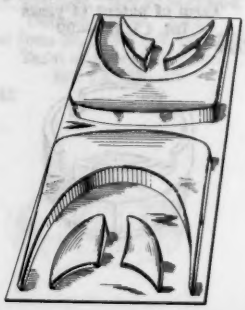
222,038
HOUSE
Henry S. Hughes, 1320 Talbryn Drive, Belmont, Calif. 94002
Filed Mar. 9, 1970, Ser. No. 21,809
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



222,039
BUILDING
Doyle T. Vaden, P.O. Box 12192, Knoxville, Tenn. 37912
Filed Oct. 9, 1969, Ser. No. 19,474
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1

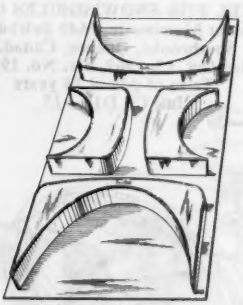


222,040
ARCHITECTURAL PANELS OR THE LIKE
J. Lawrence Gauler, Crown Point, Ind., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed May 5, 1970, Ser. No. 22,813
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

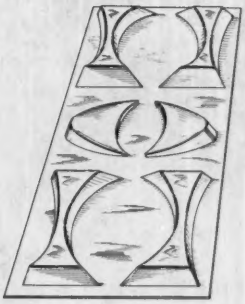


222,041
ARCHITECTURAL PANELS OR THE LIKE
J. Lawrence Gauler, Crown Point, Ind., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed May 5, 1970, Ser. No. 22,817
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

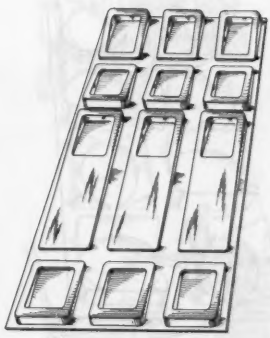
222,042
ARCHITECTURAL PANELS OR THE LIKE
J. Lawrence Gauler, 211 Sherwood Drive, Crown Point, Ind. 46307
Filed May 5, 1970, Ser. No. 22,818
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1



222,043
ARCHITECTURAL PANELS OR THE LIKE
J. Lawrence Gauler, Crown Point, Ind., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed May 5, 1970, Ser. No. 22,819
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

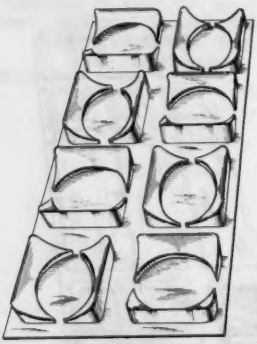


222,044
ARCHITECTURAL PANELS OR THE LIKE
Lawrence A. Bernstein, Marina del Rey, Calif., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed May 5, 1970, Ser. No. 22,820
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

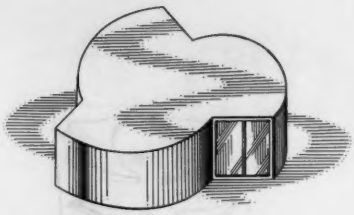


222,045
WALL PANEL
Lester V. Ottinger and Robert E. James, Danbury, and Andrew E. Carmellini, Brookfield, Conn., assignors to U.S. Plywood-Champion Papers Inc., New York, N.Y.
Filed May 13, 1970, Ser. No. 22,947
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1

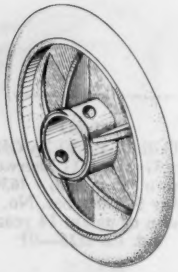
222,046
ARCHITECTURAL PANELS OR THE LIKE
J. Lawrence Gauler, Crown Point, Ind., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed May 5, 1970, Ser. No. 23,096
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—1



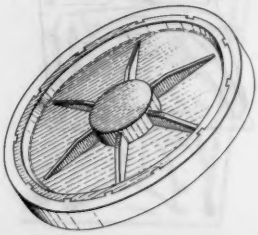
222,047
BUILDING
Elliott H. Brenner, Lafayette, Ind., assignor to Araneida, Inc., West Lafayette, Ind.
Filed July 17, 1970, Ser. No. 23,992
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1



222,048
BOGIE WHEEL FOR SNOWMOBILES OR THE LIKE
Raymond Morrissette, 1649 Belvedere S., Sherbrooke, Quebec, Canada
Filed Oct. 15, 1969, Ser. No. 19,579
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D14—30

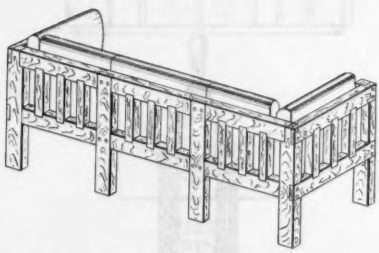


222,049
IDLER WHEEL FOR SNOWMOBILES OR THE LIKE
Raymond Morrissette, 1649 Belvedere S., Sherbrooke, Quebec, Canada
Filed Oct. 15, 1969, Ser. No. 19,580
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D14—30

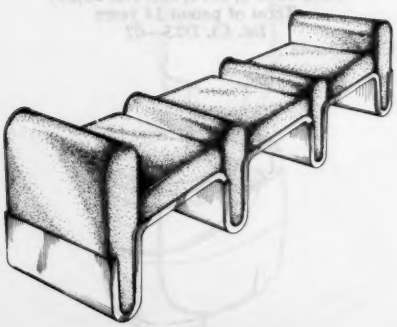


222,050
STEERING WHEEL AID
Joseph Romanoski, 48 Craven St., Huntington Station, N.Y. 11746
Filed Apr. 9, 1970, Ser. No. 22,347
Term of patent 7 years
Int. Cl. D12—*14*
U.S. Cl. D14—30

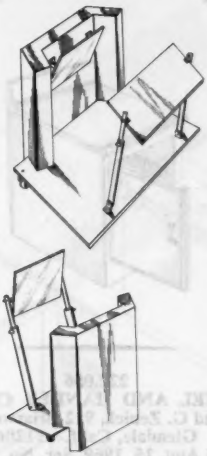
222,051
SOFA
Michael J. Shannon, 130 Greenwood Ave., Bend, Oreg. 97701
Filed July 23, 1968, Ser. No. 12,865
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—11



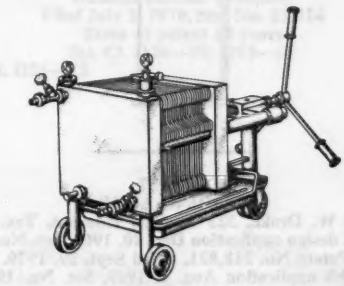
222,052
BENCH
Farid A. Iskander, Brooklyn, N.Y., assignor to Herman Miller, Inc., Zeeland, Mich.
Filed July 9, 1969, Ser. No. 18,126
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—11

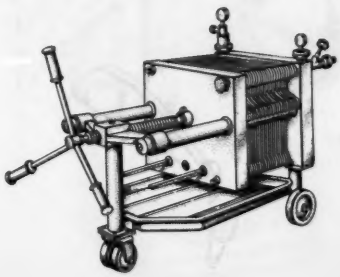


222,053
RADIATION SHADOW SHIELD
Felix R. Grat and Eugene L. Savettiere, Lake Hiawatha, and George E. Griffin, Cedar Grove, N.J., assignors to Radiation Machinery Corporation
Filed July 1, 1969, Ser. No. 18,009
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—2

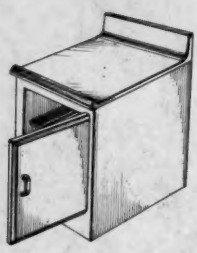


222,054
FILTERING PRESS FOR LIQUID AND GASES
Hans Becker, Bad Kreuznach, Germany, assignor to Seitz-Werke Gesellschaft mit beschrankter Haftung, Bad Kreuznach, Germany
Filed Oct. 1, 1969, Ser. No. 19,356
Term of patent 14 years
Int. Cl. D24—*02;* D23—*01*
U.S. Cl. D16—2





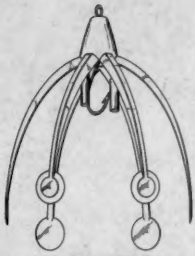
222,055
REFRIGERATED RADIOISOTOPE STORAGE CABINET
Felix R. Grat and Eugene L. Savettiere, Lake Hiawatha, and George E. Griffin, Cedar Grove, N.J., assignors to Radiation Machinery Corporation
Filed Dec. 4, 1969, Ser. No. 20,366
Term of patent 14 years
Int. Cl. D24—*02;* D15—*11*
U.S. Cl. D16—2



222,056
FISHING REEL AND HANDLE COMBINATION
Raymond G. Zenick, 912 Briarwood Lane, Glendale, Calif. 91206
Filed Aug. 25, 1969, Ser. No. 18,840
Term of patent 14 years
Int. Cl. D22—*08*
U.S. Cl. D22—25

222,057
FISHING LURE
Thomas W. Drake, 323 Lindale, Houston, Tex. 77022
Original design application Dec. 20, 1968, Ser. No. 15,073, now Patent No. 218,821, dated Sept. 29, 1970. Divided and this application Aug. 1, 1969, Ser. No. 19,811
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

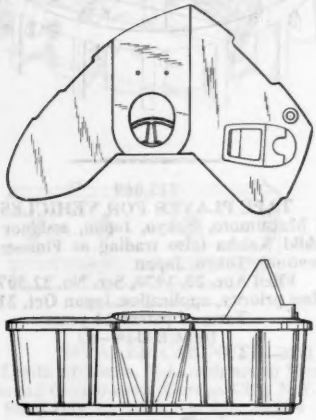
222,058
FLEXIBLE FISHING LURE
Robert A. Meadors, Houston, Tex., assignor to Doodle-Sockr Co., Inc., Houston, Tex.
Filed June 29, 1970, Ser. No. 23,750
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



222,059
FISHING LURE RETRIEVER
Denny L. Howerter, 3817 NW. 60th, Oklahoma City, Okla. 73112
Filed June 12, 1970, Ser. No. 23,446
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—31

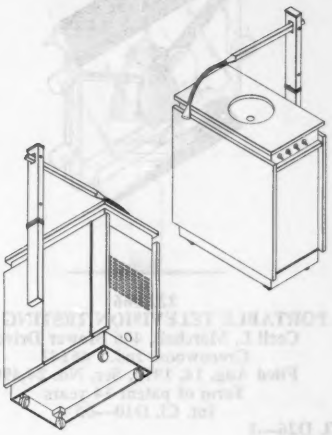
222,060
SELF-CONTAINED PORTABLE TOILET
Elias D. Quintana, La Mirada, Calif., assignor to Mission-West Manufacturing Company, Los Angeles, Calif.
Filed June 1, 1970, Ser. No. 23,247
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

222,061
COMBINED TOILET AND TANK UNIT
James L. Rutzick, St. Paul, Minn., assignor to Aquazyme Industries, Inc., St. Paul, Minn.
Filed June 19, 1970, Ser. No. 23,570
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

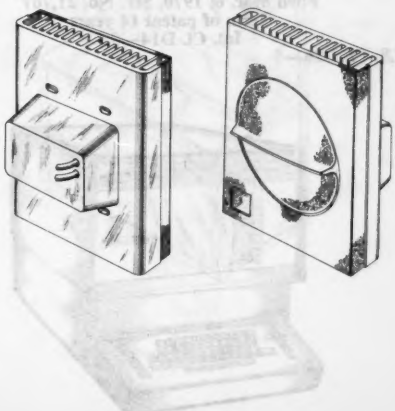


222,062
URINAL
James L. Rutzick, St. Paul, Minn., assignor to Aquazyme Industries, Inc., St. Paul, Minn.
Filed June 19, 1970, Ser. No. 23,574
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—68

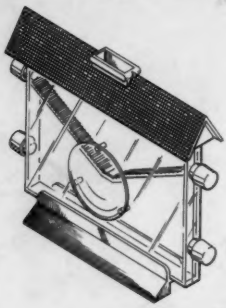
222,063
DENTAL CONSOLE
Frank I. Fuller, Portola, Valley, Calif., Shirl S. Fox, 45 Cerros Manor, Menlo Park, Calif. 94025, and Ronald F. Keller, Aptos, Calif.; said Fuller and said Keller assignors to said Fox
Filed Dec. 31, 1969, Ser. No. 20,712
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—1



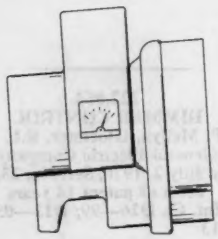
222,064
DIMMER CONTROL
Lawrence P. Mellyn, Glocester, R.I., assignor to General Electric Company
Filed July 2, 1970, Ser. No. 23,814
Term of patent 14 years
Int. Cl. D26—*99;* D13—*03*
U.S. Cl. D26—13



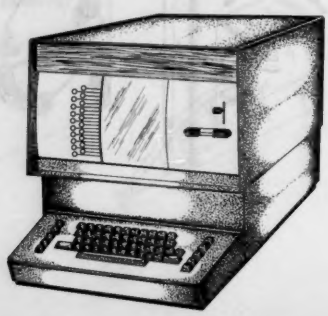
222,065
ENTOMOLOGICAL OBSERVATION DEVICE
Stanley S. Sheidlower, 43 Burton Ave., Woodmere, N.Y. 11598, and Elliot S. Glanz, 4005 Greentree Drive, Oceanside, N.Y. 11572
Filed June 11, 1970, Ser. No. 23,444
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D25—1



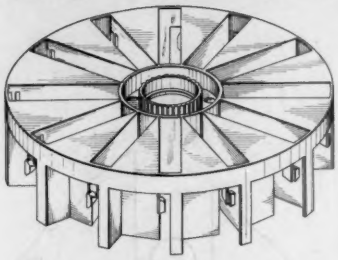
222,066
PORTABLE TELEVISION TESTING JIG
Cecil L. Marshall, 406 Brewer Drive, Greenwood, Ind. 46142
Filed Aug. 14, 1970, Ser. No. 24,490
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D26—1



222,067
ELECTRONIC CONTROL CONSOLE
Fred M. Gore, Dallas, Tex., assignor to National Data Communications, Inc., Dallas, Tex.
Filed Mar. 6, 1970, Ser. No. 21,767
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

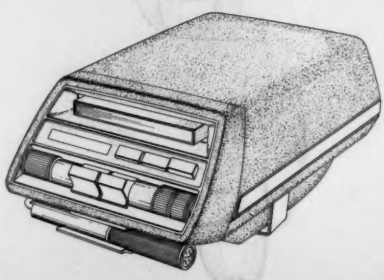


222,068
MAGNETIC TAPE CARTRIDGE MAGAZINE
Rowland K. White, Montgomery County, Md., assignor to Qatron Corporation
Filed Mar. 5, 1970, Ser. No. 21,757
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

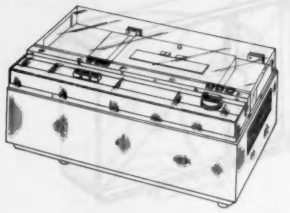


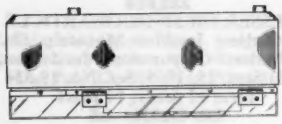
222,069
TAPE PLAYER FOR VEHICLES
Nozomu Matsumoto, Tokyo, Japan, assignor to Pioneer Kabushiki Kaisha (also trading as Pioneer Electronic Corporation), Tokyo, Japan
Filed Apr. 20, 1970, Ser. No. 22,507
Claims priority, application Japan Oct. 21, 1969
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

222,070
MAGNETIC TAPE CASSETTE MACHINE
Hari Matsuda, Evanston, Ill., assignor to Ampex Corporation, Redwood City, Calif.
Filed May 27, 1970, Ser. No. 23,182
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

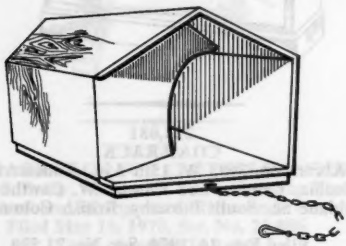


222,071
MAGNETIC TAPE RECORDER
Gerhard Dietrich, Bayern, and Alfred Mamet, Nuremberg, Germany, assignors to Triumph Werke Nuremberg A.G., Nuremberg, Germany
Filed June 29, 1970, Ser. No. 23,737
Claims priority, application Germany Jan. 27, 1970
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

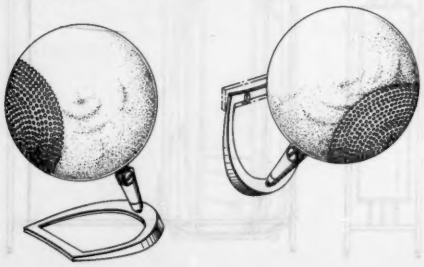




222,072
SPEAKER CABINET
Amos Levitt, Millburn, N.J., assignor to Maximus Sound Corporation, Garden City, N.Y.
Filed July 20, 1970, Ser. No. 24,024
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14

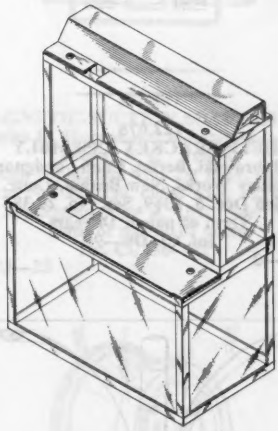


222,073
DOG HOUSE OR THE LIKE
Ralph E. Shettel, Rte. 1, Twin Falls, Idaho 83301
Filed Jan. 16, 1970, Ser. No. 20,950
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—1

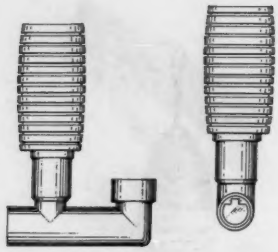


222,074
BIRD HOUSE
Charles D. Pratt, Box 264, Martinicus Island, Maine 04851
Filed June 26, 1970, Ser. No. 23,691
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—3

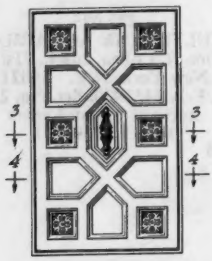
222,075
MULTI-TANK AQUARIUM
Milton R. Cohen, 200 E. 71st St., New York, N.Y. 10021
Filed Feb. 24, 1970, Ser. No. 21,593
Term of patent 7 years
Int. Cl. D30—*01*
U.S. Cl. D30—6



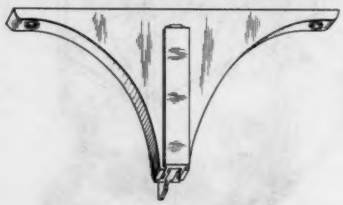
222,076
SIPHON STARTER
Allan H. Willinger, New Rochelle, N.Y., assignor to Metaframe Corporation, Maywood, N.J.
Filed Mar. 10, 1970, Ser. No. 21,842
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—12



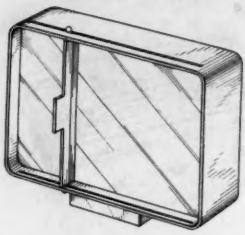
222,077
DECORATIVE DOOR FOR FURNITURE OR THE LIKE
Huey T. Keller, High Point, N.C., assignor to Empire Furniture Corporation, Johnson City, Tenn.
Filed Oct. 18, 1968, Ser. No. 14,052
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D33—1



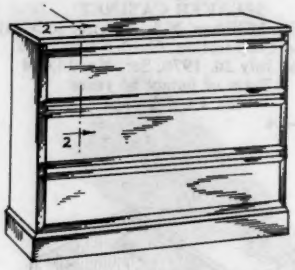
222,078
SHELF BRACKET ASSEMBLY
Louis G. Bobrowski, Berlin, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Dec. 5, 1969, Ser. No. 20,383
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—3



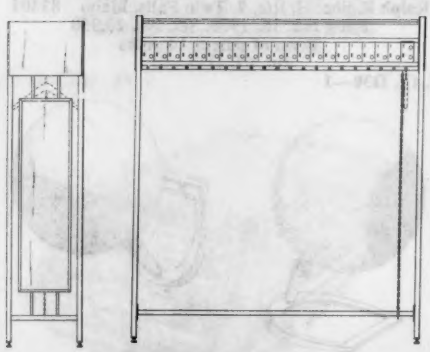
222,079
SHOWER MIRROR
Edward J. Havelock, 1022 Juanita Drive, Walnut Creek, Calif. 94529
Filed Nov. 20, 1969, Ser. No. 20,204
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D33—9



222,080
DRESSER OR SIMILAR ARTICLE
Raymond T. Carlson, Lookout Mountain, Ga., assignor to Forest Products Corporation, Morristown, Tenn.
Filed Sept. 29, 1969, Ser. No. 19,334
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—6

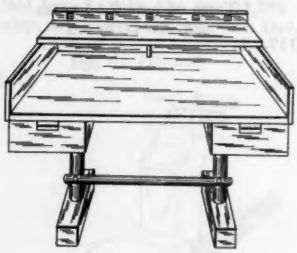


222,081
COAT RACK
Ian J. Abramson, 3485 W. 15th Ave., Vancouver, British Columbia, Canada, and Charles W. Cawthorne, 6635 Dunblane St., South Burnaby, British Columbia, Canada
Filed Feb. 24, 1970, Ser. No. 21,590
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—8

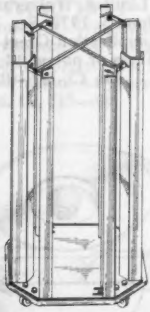


222,082
TABLE
Werner L. Kleinert, 37246 Ruth Drive, Sterling Heights, Mich. 48077
Filed May 15, 1970, Ser. No. 23,011
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—14

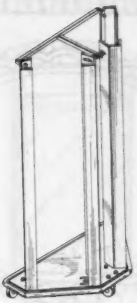
222,083
WORK TABLE
John P. Salsgiver, Acton, Mass., assignor to United Technical Corporation, West Concord, Mass.
Filed July 27, 1970, Ser. No. 24,140
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14



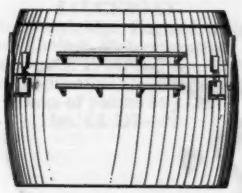
222,084
STORAGE RACK FOR CLOTHES HANGERS
Benjamin S. Boley, Richmond, Va., assignor to Thalhimer Brothers, Incorporated, Richmond, Va.
Filed May 15, 1970, Ser. No. 23,006
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—17



222,085
STORAGE RACK FOR CLOTHES HANGERS
Benjamin S. Boley, Richmond, Va., assignor to Thalhimer Brothers, Incorporated, Richmond, Va.
Filed May 15, 1970, Ser. No. 23,007
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—17

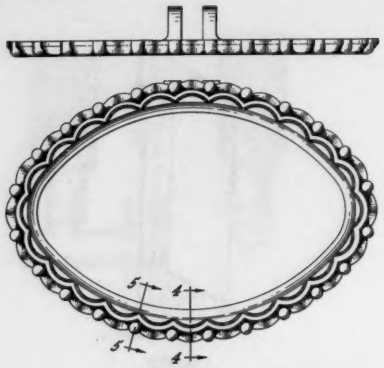


222,086
BAR CABINET
Kenneth J. Guilbeaux, P.O. Box 2371, Lafayette, La. 70501
Filed Aug. 14, 1969, Ser. No. 18,685
Term of patent 14 years
Int. Cl. D6
U.S. Cl. D33—19

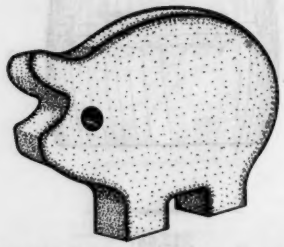


222,087
MAGNETIC-SUCTION SOAP HOLDER
Charles H. Hagopian, 2344 Davidson Ave., Bronx, N.Y. 10068
Original design application May 28, 1969, Ser. No. 17,403, now Patent No. 218,330, dated Aug. 11, 1970. Divided and this application May 4, 1970, Ser. No. 22,803
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—25

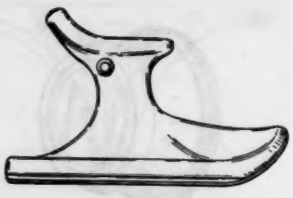
222,088
TOWEL RING
LaVerne E. Clayton, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.
Filed May 25, 1970, Ser. No. 23,118
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—32



222,089
PIG FIGURE FOR PLAYGROUND APPARATUS
Peter N. G. Murdoch and David Lance Wyman, both of 257 E. 72nd St., New York, N.Y. 10021
Filed Mar. 14, 1968, Ser. No. 11,979
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—2

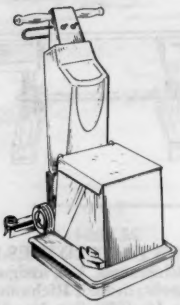


222,090
SKI-SLED OR SIMILAR ARTICLE
William F. Davis, 107 Brown St., Tecumseh, Mich. 49286
Filed July 1, 1970, Ser. No. 23,775
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

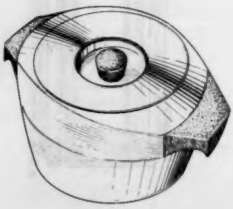


222,091
RIDEABLE BALL
Bernard A. McDermott and Samuel Scherr, Akron, and Peter A. Zorn, Jr., Peninsula, Ohio, assignors to Sun Products Corporation, Barberton, Ohio
Filed July 17, 1970, Ser. No. 23,997
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

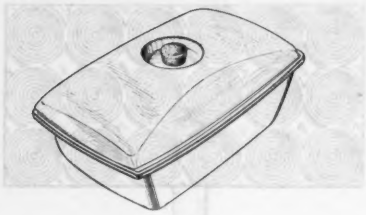
222,092
FLOOR CLEANING MACHINE
Jack L. Burgoon, Toledo, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed June 25, 1970, Ser. No. 23,670
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D37—3



222,093
STEWPAN
Graham J. Aries, Stourbridge, England, assignor to Tower Housewares Limited, Wolverhampton, England
Filed June 3, 1970, Ser. No. 23,281
Claims priority, application Great Britain Dec. 3, 1969
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1

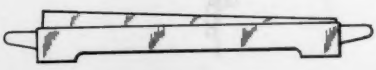


222,094
FISH COOKER
Graham J. Aries, Stourbridge, England, assignor to Tower Housewares Limited, Wombourne, Wolverhampton, Staffordshire, England
Filed June 3, 1970, Ser. No. 23,282
Claims priority, application Great Britain Dec. 3, 1969
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1



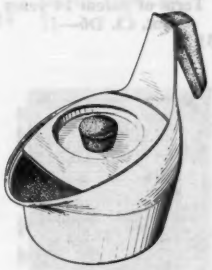
222,095
SAUCEPAN
Graham J. Aries, Stourbridge, England, assignor to Tower Housewares Limited, Wolverhampton, England
Filed June 3, 1970, Ser. No. 23,292
Claims priority, application Great Britain Dec. 3, 1969
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1

222,096
CUTTING TRAY
John N. Brown, 33 Walnut Road, West Barrington, R.I. 02890
Filed June 30, 1970, Ser. No. 23,759
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—1



222,097
CANISTER OR SIMILAR ARTICLE
David Douglas, 1332 S. 26th St., Manitowoc, Wis. 54220
Filed Sept. 22, 1969, Ser. No. 19,232
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—6

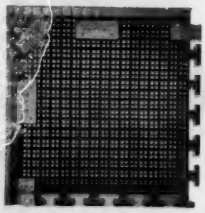
222,098
SAUCEBOAT
Graham J. Aries, Stourbridge, England, assignor to Tower Housewares Limited, Wolverhampton, England
Filed June 3, 1970, Ser. No. 23,280
Claims priority, application Great Britain Dec. 3, 1969
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—21

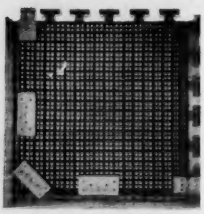


222,099
COFFEEPOT
Graham J. Aries, Stourbridge, England, assignor to Tower Housewares Limited, Wombourne, Wolverhampton, Staffordshire, England
Filed June 3, 1970, Ser. No. 23,294
Claims priority, application Great Britain Dec. 3, 1969
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—26

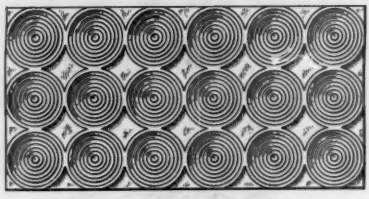
222,100
ICE CREAM DIPPER
Sheldon M. Kord, 316 Meadow Drive, Terre Haute, Ind. 47803
Filed Aug. 3, 1970, Ser. No. 24,265
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—29

222,101
MAT OR SIMILAR ARTICLE
Gordon Bagne, Santa Ana, Calif., assignor to Royal Industries, Inc., Pasadena, Calif.
Filed Feb. 16, 1970, Ser. No. 21,441
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D44—31





222,102
PRISMATIC LIGHT PANEL
Robert A. D. Schwartz and Rodney Osterberg, Oakland, Calif., assignors to Schwartz & Lindheim, Oakland, Calif.
Filed Feb. 12, 1970, Ser. No. 21,405
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16



222,103
LUMINAIRE
Eldon L. Anderson, Jr., Fletcher, N.C., assignor to General Electric Company
Filed June 1, 1970, Ser. No. 23,218
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23

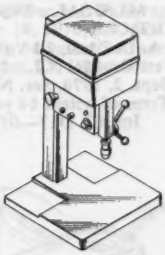
222,104
VEHICLE SAFETY LIGHT AND BRACKET THEREFOR
Kenneth G. Logan, Des Moines, Iowa, assignor to Saflite Corporation, Des Moines, Iowa
Filed May 22, 1970, Ser. No. 23,105
Term of patent 14 years
Int. Cl. D26—*06;* D29—*02*
U.S. Cl. D48—32

222,105
COMBINED GAS LIGHTER AND DETACHABLE BASE THEREFOR
Gerard Philippe Encausse, 46 Boulevard du Montparnasse, Paris 15eme, France
Filed Dec. 9, 1969, Ser. No. 20,418
Term of patent 3½ years
Int. Cl. D27—*05*
U.S. Cl. D48—27

222,106
CUTTING TOOL
Donald E. Knox, Mission, Kans., assignor to Beaver Drill & Tool Co., Kansas City, Mo.
Filed May 4, 1970, Ser. No. 22,798
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D54—4

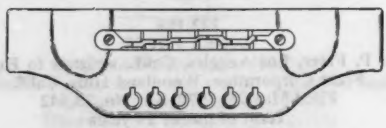
222,107
SPOON OR SIMILAR ARTICLE
James Russell Price, Esmond, R.I., assignor to Gorham, Division of Textron Inc., Providence, R.I.
Continuation-in-part of design application Ser. No. 19,081, Sept. 10, 1969. This application Aug. 4, 1970, Ser. No. 24,305
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

222,108
DRILL PRESS
Edgar P. Freer, Los Angeles, Calif., assignor to Hubach-Freer Corporation, Woodland Hills, Calif.
Filed May 25, 1970, Ser. No. 23,142
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D54—14

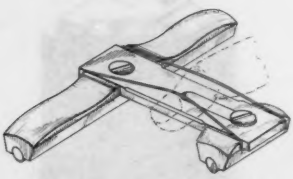


222,109
LASER CUTTING DEVICE OR SIMILAR ARTICLE
Channing W. Gilson, Los Angeles, Calif., assignor to Apollo Lasers, Inc., Los Angeles, Calif.
Filed Apr. 1, 1970, Ser. No. 22,190
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D55—1

222,110
COMBINED TAILPIECE AND ADJUSTABLE BRIDGE FOR A GUITAR OR SIMILAR ARTICLE
Stanley E. Rendell, Kalamazoo, Mich., assignor to Chicago Musical Instrument Co., Lincolnwood, Ill.
Filed May 18, 1970, Ser. No. 23,052
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1

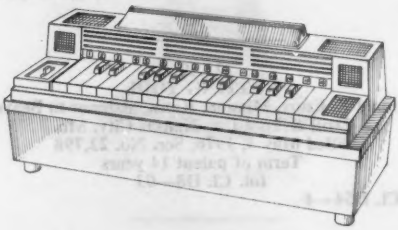


222,111
CHORD-PRODUCING FINGER BAR FOR A STRINGED MUSICAL INSTRUMENT OR SIMILAR ARTICLE
Joseph A. De Masi, 20 Yale Terrace, West Orange, N.J. 07052
Filed Sept. 2, 1970, Ser. No. 24,812
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1



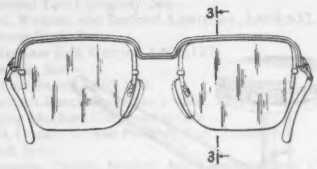
222,112
COMBINED PORTABLE ELECTRIC ORGAN, AUTOMATIC RECORD PLAYER AND STAND OR SIMILAR ARTICLE
Luciano Antonelli, Via del Guazzatore 89, Osimo, Ancona, Italy
Filed June 22, 1970, Ser. No. 23,593
Claims priority, application Italy Dec. 24, 1969
Term of patent 3½ years
Int. Cl. D17—*01*
U.S. Cl. D56—2

222,113
TOY ORGAN
Stanley G. Novaco, Nutley, N.J., assignor to Proll Products Co., Newark, N.J.
Filed Aug. 25, 1970, Ser. No. 24,684
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—2



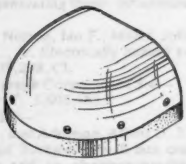
222,114
AUTOMATIC PHONOGRAPH
Wilhelm Menke, Bingen (Rhine), Germany, assignor to NSM Apparatebau GmbH, Bingen (Rhine), Germany
Filed Sept. 24, 1970, Ser. No. 25,180
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4

222,115
OPHTHALMIC SPECTACLES
Luc André Marcel Tagnon, Paris, France, assignor to Societe des Lunetiers, Societe en Commandite Simple, Paris, France
Filed Aug. 7, 1969, Ser. No. 18,576
Claims priority, application France Feb. 28, 1969
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1

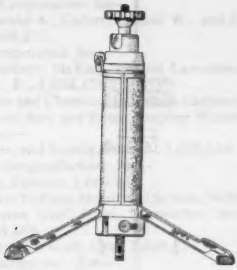


222,116
EYEGLASSES
Fernando Fallik, Buenos Aires, Argentina, assignor to Ruth Nehmad, Buenos Aires, Argentina
Filed Apr. 15, 1970, Ser. No. 22,437
Claims priority, application Argentina Oct. 24, 1969
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1

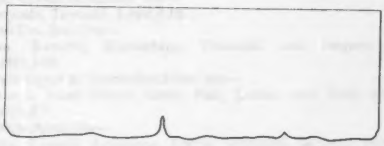
222,117
ILLUMINATED CURBING NOSE SECTION
Wilfried Baatz, Bellevue, Wash., assignor to Traffic & Safety Control Systems, Inc., Seattle, Wash.
Filed June 8, 1970, Ser. No. 23,375
Term of patent 14 years
Int. Cl. D25—*99*; D26—*99*
U.S. Cl. D60—1



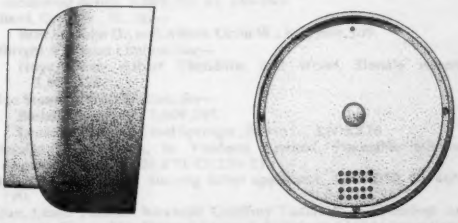
222,118
TRIPOD
Koma Nakatani, 10–9, 4-chome, Saginomiya, Nakano-ku, Tokyo, Japan
Filed Aug. 22, 1969, Ser. No. 18,811
Claims priority, application Japan Feb. 22, 1969
Term of patent 14 years
Int. Cl. D16—*07*
U.S. Cl. D61—1



222,119
ROOF COVERING OR SIMILAR ARTICLE
Robert F. Green, Westfield, N.J., assignor to Johns-Manville Corporation, New York, N.Y.
Filed Nov. 12, 1969, Ser. No. 20,050
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D68—1

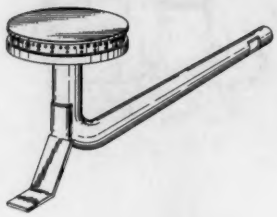


222,120
EMERGENCY REPORTING CALL BOX
George L. Payne, Bedford Hills, N.Y., assignor to International Telephone and Telegraph Corporation
Filed Apr. 10, 1970, Ser. No. 22,367
Term of patent 14 years
Int. Cl. D29—*99*
U.S. Cl. D72—1



222,121
SIGNAL FOR STORE CLERKS
Robert M. Akers, 1301 E. Reno, Oklahoma City, Okla. 73101
Filed Apr. 29, 1970, Ser. No. 22,704
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D72—1

222,122
BURNER CAP ASSEMBLY
Albert F. Craver, Bay Village, Ohio, assignor to The W. J. Schoenberger Co., Cleveland, Ohio
Filed May 13, 1970, Ser. No. 22,952
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D81—10



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF SEPTEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A-Z International Tool Company: *See*—
Medders, Weldon; and Sanford, Lawrence, 3,608,652.

AB Lyckeaborgs Bruk: *See*—
Lewin, Gunnar Erik Werner, 3,608,127.

AB Vagbelysning: *See*—
Habro, Lars Bertil, 3,609,340.

Abbatelli, Peter A.Baseball catcher's mask. 3,608,089, Cl. 2-9.

ABC Packaging Machine Corporation: *See*—
Reichert, Donald G.; and Petrikin, Earl, 3,608,440.

Abel, Bernard: *See*—
Birr, Jacques; Donze, Michel; Abel, Bernard; and Charbonnier, Patrice,3,608,879.

Abele, Manlio G., to General Applied Science Laboratories, Inc. Microwave communication system for moving land vehicle. 3,609,675, Cl. 340-22.

Abex Corporation: *See*—
Larson, Hugo R.; Harris, Henry M. T.; and Nitz, Jacob, 3,608,170.
Wilson, Rosser L.; Convey, Robert W.; and Frank, Earl E., 3,609,350.

Abildgaard Laboratories Inc.: *See*—
Abildgaard, William H.; Groswith, Charles T., III; and Melgaard, Hans L., 3,608,116.
Abilgaard, William H.; Groswith, Charles T., III; and Travaglio, Dalny, 3,608,117.

Abildgaard, William H.; Groswith, Charles T., III; and Melgaard, Hans L., to Abildgaard Laboratories Inc. Method and apparatus for vacuum molding,book bindings. 3,608,116, Cl. 11-1.

Abilgaard, William H.; Groswith, Charles T., III; and Travaglio, Dalny, to Abildgaard Laboratories Inc. Machine for binding and punching sheets. 3,608,117, Cl. 11-1.

Abramian, Lev Ivanovich: *See*—
Zabiyakin, Vyacheslav Petrovich; Abramian, Lev Ivanovich; Anisimov, Alexandr Pavlovich; Nikishin, Oleg Ivanovich; Saranova, Ljudmila Dmitrievna; and Berends, Tatyana Konstantinovna,3,608,470.

Abrashev, Georgi Ivanov: *See*—
Yordanov, Yordan Todorov; Abrashev, Georgi Ivanov; Georgiev, Georgi Tenev; Zhekov, Velyo Dimitrov; Yanev, Yancho Hristov; Rossenov, Ivan Georgiev; Prodanov, Velcho Angelov; and Roussev, Yordan Todev,3,608,881.

ACF Industries, Inc.: *See*—
Yeates, Richard P., 3,608,934.

Acker, Jesse L.: *See*—
Novack, Bernard; and Acker, Jesse L.,3,608,545.

Ackerman, James H., to Sterling Drug Inc. 3-Heterocyclic imido-5-substituted-2,4,6-triiodo benzoic acids and derivatives thereof. 3,609,147, Cl. 260-243.

Ackermann, Jacob; Ferre, Franco; and Anessi, Giorgio, to Societa Italiana Resine S.p.A. Process for stabilizing polyoxymethylenes. 3,609,124, Cl. 260-67.

Acme Highway Products Corporation: *See*—
Berchou, William J.; and Bryan, Freel F., 3,608,442.
Sharpe, James F., 3,608,445.

Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Variable pitch narrow band noise generator. 3,609,201, Cl. 84-1.01

Adachi, Takeshi, to Nippon Gakki Seizo Kabushiki Kaisha. Portamento to musical instrument having a single tone and envelope control. 3,609,203, Cl. 84-1.01

Adams, Robert H. Illuminated fishing float. 3,608,227, Cl. 43-17.

Adamski, Joseph, to Dura Corporation. Folding top mechanism for convertible type automobile. 3,608,956, Cl. 296-117.

Adamsky, Noi Mikhailovich: *See*—
Karpacheva, Susanna Mikhailovna; Muratov, Valerian Matveevich; Raginsky, Leonid Solomonovich; Ilgisonis, Igor Viktorovich; and Adamsky, Noi Mikhailovich,3,608,866.

Adamson, Arthur W., to Batetelle Development Corporation. Method and apparatus for generating three- dimensional patterns. 3,609,706, Cl. 340-173.

Adamson, Gerald J.; Norton, Ian F.; Miller, John W.; Fagan, John C.; and Eaton, John L., Jr. Electrically heated kettle with disassembly control means. 3,609,298, Cl.

Addressograph-Multigraph Corporation: *See*—
Schulze, Erwin F. C., 3,608,485.

Adelman, Albert H.: *See*—
Lewis, Jordan D.; and Adelman, Albert H.,3,609,707.

Adolfsson, Karl Fritjof Torbjorn. Small size crane having a hydraulically operated jib and an electromotor-driven hydraulic pump. 3,608,742, Cl. 212-35.

Adra, Tarek; and Draper, Robert P., to Hubbell, Harvey, Incorporated. Floodlight reflector retaining means. 3,609,337, Cl. 240-3.

Adret Electronique: *See*—
Charbonnier, Roger, 3,609,576.

Aerojet-General Corporation: *See*—
Hankins, Ronald A.; Culver, Donald W.; and Scammon, Harrison B., Jr., 3,608,833.

Aeroprojects Incorporated: *See*—
Kartluke, Herbert; McKaig, Harold Lawrence, Jr.; and Tarpley, William B., Jr., 3,608,178.

African Explosives and Chemical Industries Limited: *See*—
Gibbon, Trevor Rex; and Kotze, Stephen Walters, 3,608,421.

A.G. Concast: *See*—
Meier, Walter; and Koenig, Peter J., 3,608,614.

Agfa-Gevaert Aktiengesellschaft: *See*—
Ambraschka, Kasimir, 3,609,039.
Fauth, Gunter; Guthke, Horst; and Schulz, Willi, 3,608,449.
Herzhoff, Peter; Gref, Hans; Schweicher, Wolfgang; and Voss, Karl, 3,608,803.
Simm, Walter; and Koch, Otto, 3,608,821.

Air Control Industries, Inc.: *See*—
Hathaway, Kenneth J., 3,609,289.

Air Cushion Vehicles, Inc.: *See*—
Ferguson, Hugo S., 3,608,662.
Ferguson, Hugo S., 3,608,663.

Air Products and Chemicals, Inc.: *See*—
Manson, John A.; and Moore, George L., 3,609,130.
Singleton, Alan H.; and Biskis, Edward G., 3,608,324.

Air Reduction Company, Incorporated: *See*—
Anderson, Emmett R., 3,609,200.
Smith, Hugh Roscoe, Jr., 3,609,378.
Terrell, Ross C., 3,609,196.

Airosus, A. Albert. Fluid dispensing. 3,609,052, Cl. 401-199.

Aisan Kogyo Co., Ltd.: *See*—
Uozumi, Junzo; Suzuki, Toshikazu; Kuno, Kaneo; and Iwata, Junki, 3,608,872.

Aisin Seiki Company Limited: *See*—
Inada, Masami; Hayashi, Tatsuo; and Takayama, Katuki, 3,608,982.

Aisin Seiki Kabushiki Kaisha: *See*—
Kobayashi, Toyoaki, 3,608,678.

Ajinomoto Co., Inc.: *See*—
Iijima, Kazumi; Komachiya, Yoshioki; and Negoro, Eiji, 3,609,169.

Ajkai Timfoldgyar es Aluminiumkoho: *See*—
Harsanyi, Josef; Pinter, Geza; Pais, Zoltan; and Toth, Zoltan, 3,608,871.

Akatsu, Mitsuharu: *See*—
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Canup, Robert E., to Texaco Inc. Continuing high frequency energy ignition system with improvements. 3,608,534, Cl. 123-148.
Capitanio, Valmarino. Anti-seizing safety device for motor or the like vehicles. 3,609,454, Cl. 317-9.
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Little, William E.; and Barton, Robert M., 3,608,437.
Castaldo, Stanley C. Illuminated handbag. 3,609,341, Cl. 240-6.45
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Castro, Anthony J.; and Miller, Eugene J., Jr., to Armour Industrial Chemical Company. Method of producing vinyl halide polymers in the presence of hydroxyl-or mercapto-alkylsulfoxide emulsifiers. 3,609,133, Cl. 260-92.1
Castro, Bernard; Barabas, John J.; and Brindisi, Joseph A., to Castro Convertibles Corporation. Integrated sofa-bed and television unit. 3,608,101, Cl. 5-2.
Castro Convertibles Corporation: *See—*
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Bagshaw, Stanley Robert, 3,609,070.
Cavagnero, Erman V.; and Loftus, Joseph F., to Torin Corporation. Machine for producing welded bearings and the like. 3,609,276, Cl. 219-64.
Cavalla, John F.; Simpson, Roy; and White, Alan C., to Wyeth, John & Brother Limited, mesne. Lower alkyl 9-carboxylates of 9-(tert.-amino- butynyl)fluorenes. 3,609,179, Cl. 260-471.
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Chakar, George J.; Eberle, Frederick L.; and Ostrofsky, Bernard, said Chakar assor. to Automation Industries, Inc., and said Eberle and said Ostrofsky assors. to Standard Oil Company. Portable electronic equipment. 3,608,362, Cl. 73-67.8
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Champigny, Patrick. Headlight wiper. 3,608,123, Cl. 15-250.22
Chapman, Ronald H.; and Michalik, James J., to Motorola Inc. Oscillator having feedback amplitude control and switchable output phase shifter. 3,609,578, Cl. 331-45.
Chappell, Terence R.; Heeks, Thomas R.; Rogers, Michael J.; and Shelley, John H., to Smiths Industries Limited. Method and apparatus for controlling one oscillator by another. 3,609,579, Cl. 331-46.
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Chomes, Harry. Flashing cap receiver. 3,608,255, Cl. 52-61.
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Christian, George C. Load responsive gripping device for flexible cable drives and the like. 3,608,389, Cl. 74-242.9
Christmann, John L., to Merrick Scale Mfg. Company. Mass measuring system. 3,608,359, Cl. 73-67.2
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Clementi, Sandro. Plastic containers and cover closures therefor. 3,609,263, Cl. 220-60.

Clifford, William, Jr.; Demko, John G.; and Kindle, William K., to Electronic Associates Inc. Digital plotter in which plotting speed is optimized in terms of a curve-fitting technique. 3,609,319, Cl. 235-151.11

Clingenpeel, William R.; Hungerford, Philip C., Jr.; Hayes, Robert R.; and Jennens, Thomas W., to ESB Incorporated, mesne. Machine used in electrically testing battery inter- cell connectors and terminal posts. 3,609,525, Cl. 324-29.5

Cloutier, Oscar H.; Huber, Ernest F., Jr.; and Ingves, Wallace W., to New England Merchants National Bank of Boston, mesne. Mold coupling for sole injecting machines. 3,608,151, Cl. 18-30.

Cobarg, Claus-Christian, to Braun Aktiengesellschaft. Plane indicator setting arrangement. 3,608,306, Cl. 58-126.

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Cogliano, Joseph A. Collapsible bicycle. 3,608,917, Cl. 280-7.16

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Cole, Clyde C. Electrical connector. 3,609,637, Cl. 339-75.

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Collier, John Covell; and Rickards, David William, to AMP Incorporated, mesne. Sliding switch programmer for controlling multiple switches. 3,609,255, Cl. 200-1.

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Conlon, John J., to Phelps Dodge Corporation. Foil production. 3,608,615, Cl. 164-87.

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Conway, Alvin C.: *See—*
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Cornelius, Richard T., to Cornelius Company, The. Method and apparatus for producing and dispensing a semi-frozen carbonated beverage. 3,608,779, Cl. 222-54.

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Corsini, Vincent: *See—*
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Cotton, Herbert John Thomas; and Hemmings, Robert. Dynamo electric machine having improved slip ring assembly. 3,609,428, Cl. 310-232.

Cottrell, Arnold George, to Imperial Chemical Industries Limited. Preparation of fire-extinguishing material by heating dicyandiamide with alkali metal carbonates or bicarbonates. 3,608,641, Cl. 169-1.

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Cowans, Kenneth W., to Sub-Marine Systems Incorporated. Flow compensator for exchanger apparatus. 3,608,629, Cl. 165-165.

Cox, David, to Eastman Kodak Company. Information storage and retrieval system. 3,608,714, Cl. 209-80.5

Coyle, Jan R. Automatic canopy buckle. 3,608,160, Cl. 24-230.

Coyle, John Cadden, to Rolls-Royce Limited. Apparatus for indicating changes in angular velocity, and vehicle braking systems employing such apparatus. 3,608,979, Cl. 303-21.

Cragon, Harvey G.; and Kastner, William D, to Texas Instruments, Incorporated. Optimized read only memory using tag bits. 3,609,708, Cl. 340-173.

Crall, Russell D., to Stewart Engineering & Equipment Company. Conveyor system and switch conveyor. 3,608,698, Cl. 198-81.

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Croitoru, Petrica, to Institutul de Fizico Atomica (IFA). High-intensity neutron generator with radiation acceleration. 3,609,369, Cl. 250-84.5

Croker, John Henry, to Gestetner Limited. Planographic printing plate. 3,608,489, Cl. 101-462.

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Cucciati, Pietro. Lubrication device for unbalanced rotating members, particularly percussion tools. 3,608,673, Cl. 184-6.14

Cuff, Ernest N. Instrument for indicating horsepower output of an engine. 3,608,368, Cl. 73-117.3

Cull, Duncan E.: *See—*
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Culp, John F. Field cultivator. 3,608,642, Cl. 172-62.

Culp, William F., to Goodyear Tire & Rubber Company, The. Elastomeric buffer mounting assembly. 3,608,882, Cl. 267-140.

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Curran, Bernard E., to Robertson, H. H., Company. Floor structure and building construction panel therefor. 3,608,267, Cl. 52-332.

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Curtis, James H., to General Electric Company. Electrolytic capacitor and electrolyte material therefor. 3,609,467, Cl. 317-230.

Cushing, Vincent J. Eiectromagnetic flowmeter. 3,608,375, Cl. 173-194.

Cushman, Robert Holbrook, to Western Electric Company, Incorporated. Apparatus for uniform multiple lead bonding. 3,608,809, Cl. 228-44.

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Cyriax, Wilhelm; and Schutt, Rainer, to Battenfeld Maschinenfabriken GmbH. Mold system for the production of elongated hollow injection-molded articles. 3,608,133, Cl. 18-2.

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Dallet, Bernard; Doucerain, Jacques; and Moulin, Jean, to Societe de Traitements Electrolytiques et Electro thermiques (.S.T.E.L.). Brazing press particularly for brazing extended surfaces having relieved corners to a matching plate. 3,609,277, Cl. 219-6.5

Damsky, Walter; Joisten, Siegfried; and Sajben, Janos, to Farbenfabriken Bayer Aktiengesellschaft. Apparatus for the continuous production of precision profiles from plastics. 3,608,144, Cl. 18-12.

Dandridge, Gerard W. Automatic gear lubricator. 3,608,672, Cl. 184-6.

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Danielmeyer, Hans G., to Bell Telephone Laboratories, Incorporated. Laser with pulsed-transmission-mode Q-switching. 3,609,586, Cl. 331-94.5

Danofsky, Richard A.; and Hendrickson, Richard A., to Iowa State University Research Foundation. Testing apparatus for count rate circuits using pulses. 3,609,536, Cl. 324-57.

Dargitz, Larry L.; and Muhlbeier, Arthur J., to Skagit Corporation. Constant tension winch. 3,608,864, Cl. 254-172.

Darrey, John J. Extension cord coupling clamp assembly. 3,609,638, Cl. 339-75.

Darrow, John O. G.: *See—*
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Davidson, James R., to Xerox Corporation. Xerographic development control apparatus. 3,608,522, Cl. 118--637

Davidson, Richard C. Toy aircraft vehicle. 3,608,234, Cl. 46-47.

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Davis, Cecil J.; and Matthews, Robert T., to Bridge Data Products, Inc., mesne. Card reader. 3,609,305, Cl. 235-61.11

Davis, Edgar S.: *See—*
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Davis, Fredrick Darell: *See—*
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Davis, Raymond; and Krill, Charles K. Thermal display unit. 3,609,659, Cl. 340-166.

Davis, William H.; and Heard, Roderick S., to International Business Machines Corporation. Automatic measure selection for composer system. 3,609,699, Cl. 340-172.5

Dawson, John W.; and Kustom, Robert L., to United States of America, Atomic Energy Commission. Traveling wave particle separator including a rectangular wave guide lined with a dielectric material. 3,609,351, Cl. 250-41.9

Dazzi, Joachim, to Geigy Chemical Corporation. Lubricant, grease and hydraulic fluid. 3,609,080, Cl. 252-47.5

De Barros, Ruy Francisco Menino. Interconnection device for electronic systems. 3,609,462, Cl. 317-101.

De Bitetto, Dominick John, to U.S. Philips Corporation, mesne. Method and apparatus for three dimensional imaging. 3,608,993, Cl. 350-3.5

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Fenner, Ralph L., to Hygrometrix, Inc. Xerometer. 3,608,377, Cl. 73-337.5

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Greenspan, Saul. Apparatus for filtering and collecting solid matter from a smoke flow. 3,608,278, Cl. 55-212.

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Rakes, Rodney G., to Sperry Rand Corporation. Optically commutated brushless D. C. motor having controlled light source. 3,609,493, Cl. 318-254.

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Ratliff, Troy L. Conduit cleaning apparatus. 3,608,122, Cl. 15-104.3

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TO WHOM

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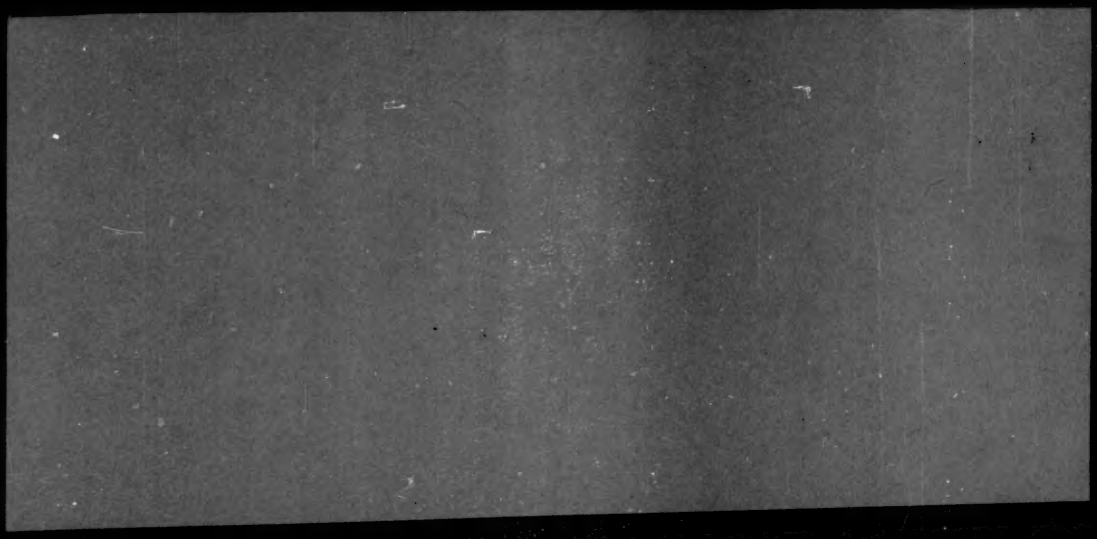

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Maurice H. Stans, *Secretary*

PATENT OFFICE
Robert C. Watson, *Acting Commissioner*